



Workshop Manual SpaceFox, Space Cross, Suran, Suran Cross, Sportvan 2006 ➤

Heating, air conditioning

Edition 05.2011





List of Workshop Manual Repair Groups

Repair Group

80 - Heating

87 - Air conditioning

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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80 – Heating

1 Heating - cabin components (up to model-year 2010)



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- → Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the battery earth strap.*
- ◆ *When the battery is reconnected, check the operation of the vehicle electrical system (radio, clock and electric door and window locks, etc.) according to the Workshop Manual and/or instructions for use.*





1 - Side air vents with frame

- ☐ Remove and install
⇒ [page 6](#)
- ☐ With built-in air vents for side windows

2 - Demisting baffle

- ☐ Remove only after the dashboard has been removed

3 - Centre vent baffle

- ☐ Remove and install
⇒ [page 7](#)

4 - Ventilation adjustment mechanism

- ☐ Remove and install
⇒ [page 9](#)

5 - Demister nozzle

- ☐ Remove and install
⇒ [page 8](#)

6 - Air duct

- ☐ For the right air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

7 - Air duct

- ☐ For the left air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

8 - Air distributor for baffles

- ☐ Remove and install
⇒ [page 8](#)

9 - Control motor for the fresh air valve and the recirculation valve -V154-

- ☐ Only for vehicles with A/C

10 - Fresh air fan -V2-

- ☐ Remove and install ⇒ [page 3](#)

11 - Front right footwell air duct

- ☐ Remove and install ⇒ [page 7](#)

12 - Lower central frame

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

13 - Dust and pollen filter

- ☐ Remove and install ⇒ [page 5](#)

14 - Heat exchanger

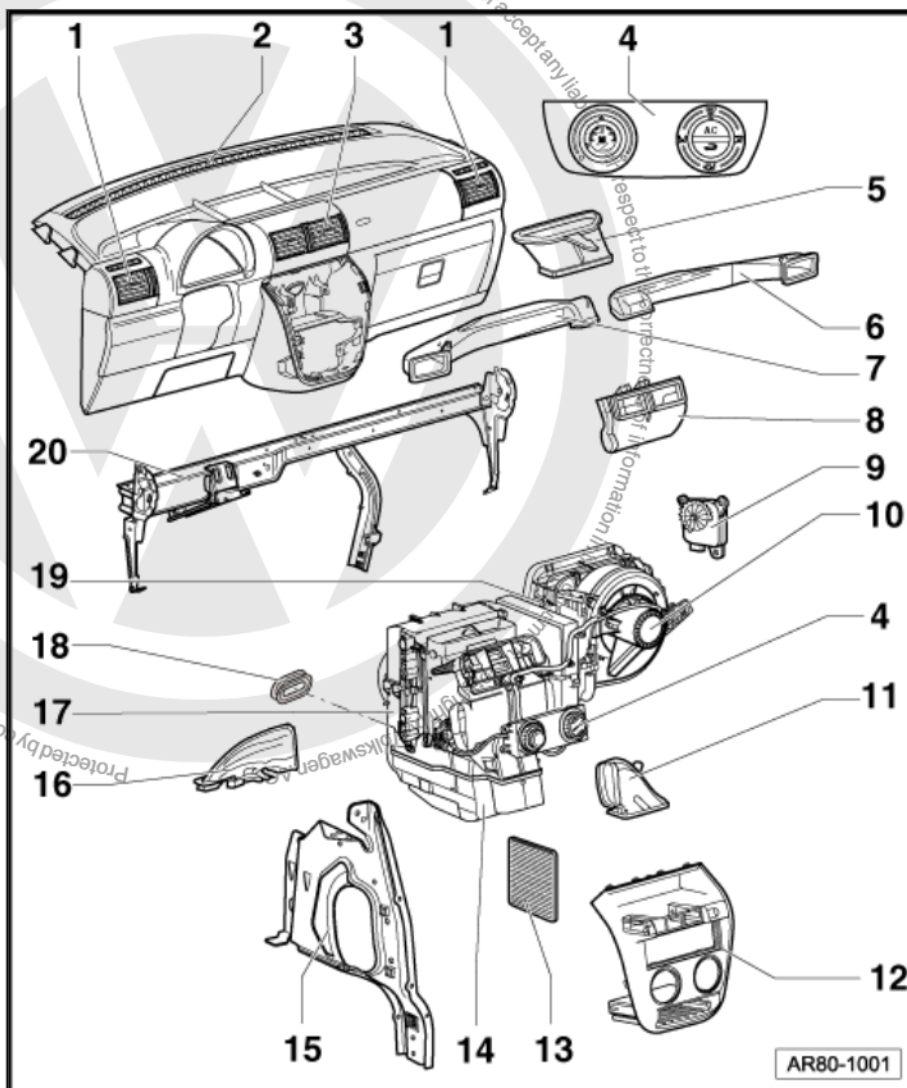
- ☐ Remove and install ⇒ [page 36](#)

15 - Left mounting of transverse support

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

16 - Front left footwell air duct

- ☐ Remove and install ⇒ [page 7](#)





17 - Plenum chamber

- ☐ Remove and install ➔ [page 23](#)
- ☐ Disassemble and assemble ➔ [page 31](#)

18 - Heat exchanger/engine compartment partition panel sealing

- ☐ Observe the installation position ➔ [page 3](#)
- ☐ Replace if damaged

19 - Fresh air fan pre-resistor with overheat fuse -N24-

- ☐ Remove and install ➔ [page 4](#)

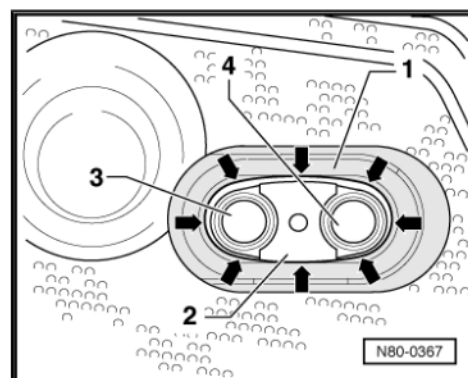
20 - Transverse support

- ☐ Remove and install ➔ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

Installation position of the heat exchanger seal

- First install -1- heat exchanger sealing -2- and then the partition sealing. Check if the seal is in the correct fitting position -arrows-.

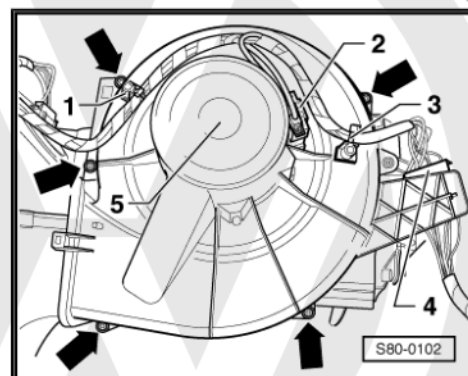
Observe the correct installation of intake -4- and outlet -3- coolant hoses in the heat exchanger.



1.1 Fresh air fan -V2- - remove and install

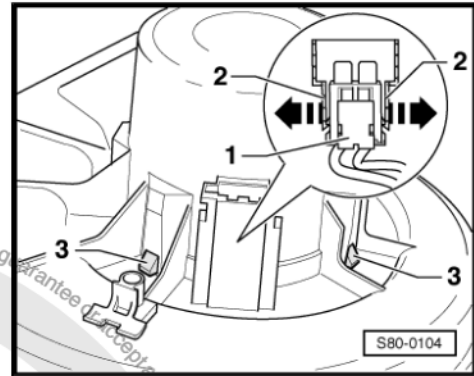
1.1.1 Removal

- Pull off connector -2- at the fan.
- Cut fastenings carefully -1- and -3- from cables.
- Disconnect and loosen the connector -4- from fan housing -5-.
- Remove the attaching screws -arrows- and remove fan housing.





- Use a small screwdriver to release connector locks -2- in the direction of the arrows and push the connector -1- down.
- Press the locks -3- inwards and downwards with a screwdriver.
- Remove the Fresh air fan -V2- from fan housing.



1.1.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- ♦ The Fresh air fan -V2- is different for the heating and air conditioning equipment - check the part number.
- ♦ The connector must be connected correctly.
- ♦ The locks -3- must leave the fan housing completely.
- ♦ Check fan function prior to installation in fan housing
⇒ [page 4](#).

1.2 Fresh air fan -V2- - check

- Connect the Diagnosis, Measurement and Information System -VAS 5051A/52-.
- Select, on Diagnosis, Measurement and Information System -VAS 5051A/52- function Assisted Fault Pinpointing.
- Select the corresponding version, vehicle, model, year and engine and press Advance.

After consulting all command units, select the following functions:

- ♦ Advance
- ♦ Go to
- ♦ Selection of Functions/Components
- ♦ Body
- ♦ Heating, Ventilation and Air Conditioning
- ♦ Electrical components
- Continue selecting the functions you want in Diagnosis, Measurement and Information System -VAS 5051A/52- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

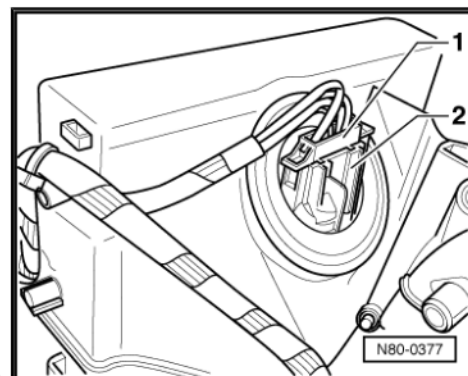
1.3 Fresh air fan pre-resistor with overload fuse -N24- - remove and install

1.3.1 Removal

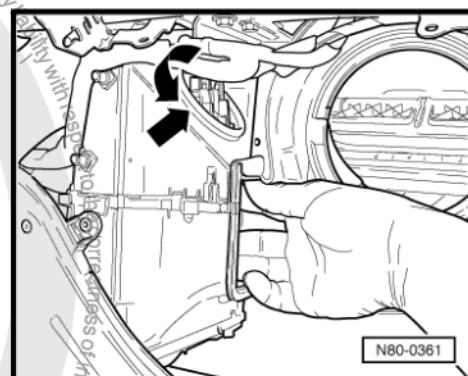
- Remove the Fresh air fan -V2- ⇒ [page 3](#).



- Pull off connector -1- from the Fresh air fan pre-resistor with overheat fuse -N24- -2-.



- Turn counter-clockwise Fresh air fan pre-resistor with overheat fuse -N24- inside the fan housing.



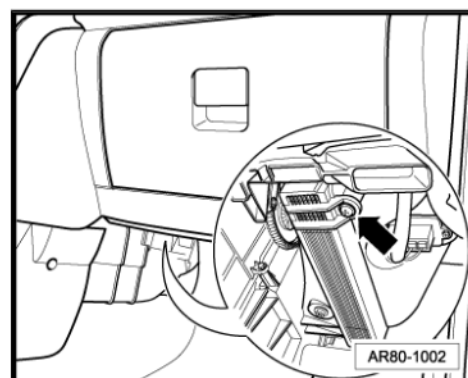
1.3.2 Installation

Installation is carried out in the reverse order of removal.

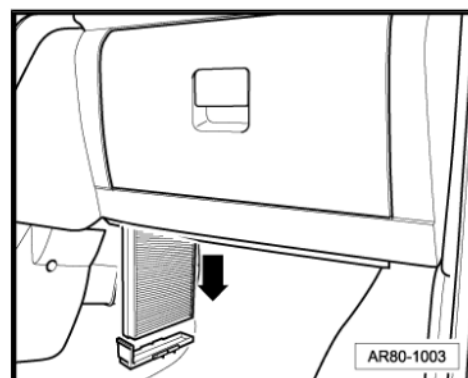
1.4 Dust and pollen filter - remove and install

1.4.1 Removal

- Loosen the screw -arrow- from the dust and pollen filter cover.

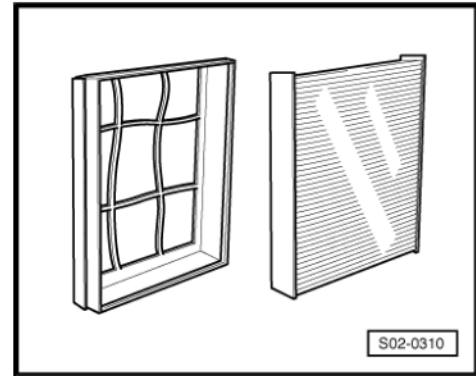


- Remove the dust and pollen filter -arrow-.





- Remove the filtering element from framework.



1.4.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Check the filtering element installation position in the framework.

1.5 Side air vents - remove and install



Note

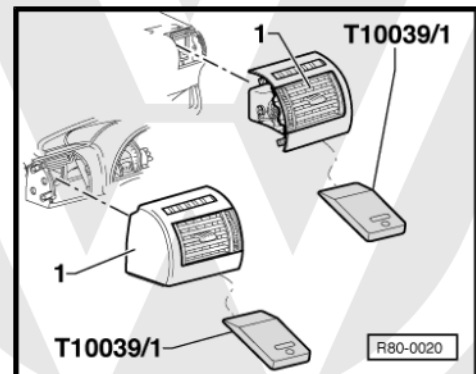
The removal of the air vents is similar on both sides.

Special tools and workshop equipment required

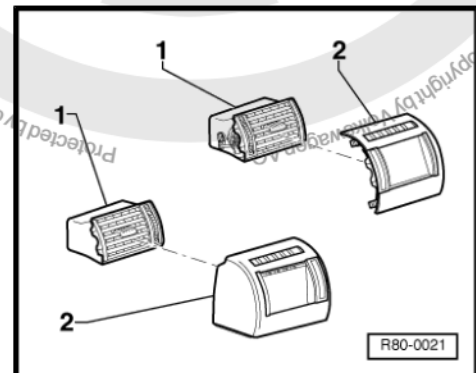
- ◆ Lever -T10039-

1.5.1 Removal

- Remove the side vent fixing clamp.
- Extract and remove the vents along with the frame using the Lever -T10039- .



- Lightly press the latches at the rear end of the frame -2- and detach the deflector -1- from behind.





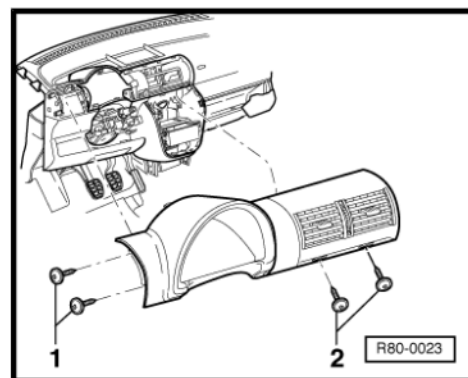
1.5.2 Installation

Installation is carried out in the reverse order of removal.

1.6 Central air vent - remove and install

1.6.1 Removal

- Remove the left air vent ⇒ [page 6](#) .
- Remove screws -1-.
- Remove the central frame of the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .
- Remove screws -2-.
- Remove the central air vents along with the frame.
- Slightly press the locks at the frame rear part and detach the vent backwards.



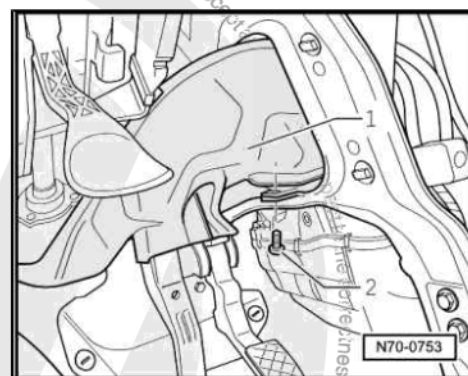
1.6.2 Installation

Installation is carried out in the reverse order of removal.

1.7 Left footwell air duct - remove and install

1.7.1 Removal

- Remove the screw -2-.
- Remove the air duct -1-.



1.7.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Tighten the fixing screw with a 1.5 Nm torque.

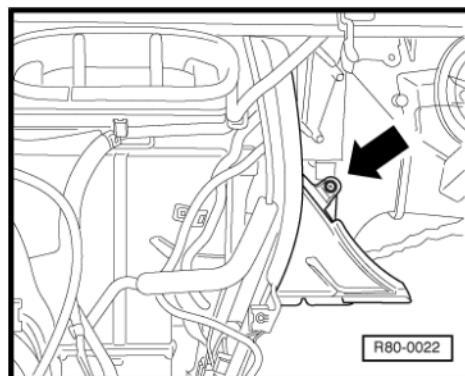
1.8 Right footwell air duct - remove and install

1.8.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .



- Remove the screw -arrow-.
- Remove footwell air duct.



1.8.2 Installation

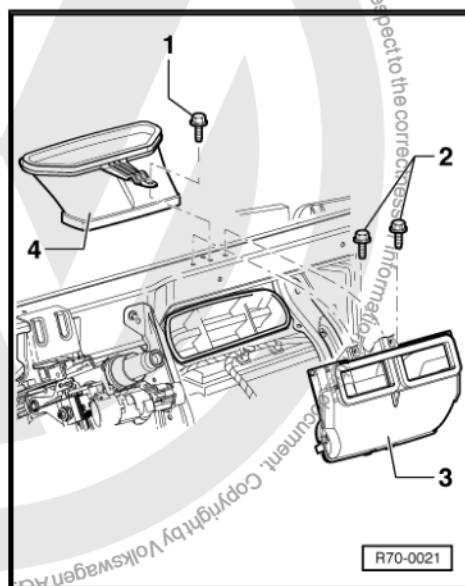
Install by inverting the removal sequence, paying attention to the following:

- Tighten the fixing screw with a 1.5 Nm torque.

1.9 Defogger nozzle and air vents distributor - remove and install

1.9.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .
- Remove the side vent air ducts by detaching them from the air vent distributor -3-.
- Remove screws -1- and -2-.
- Remove defogger nozzle -4- and the air distributor to the vents -3-.



1.9.2 Installation

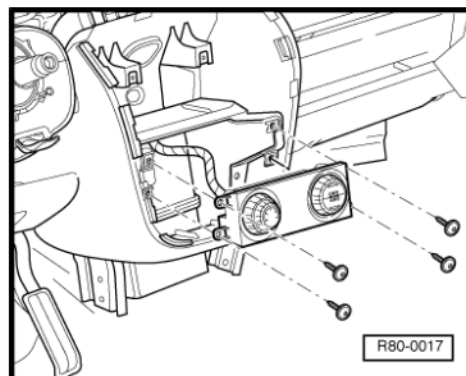
Installation is carried out in the reverse order of removal.



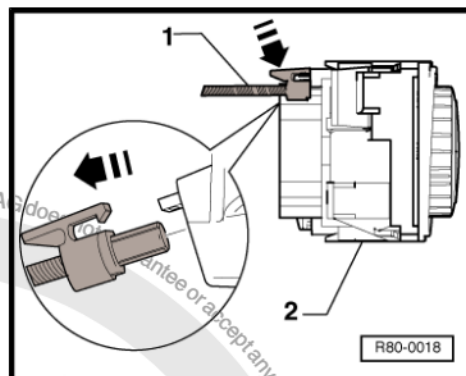
1.10 Ventilation adjustment mechanism - remove and install

1.10.1 Removal

- Remove the radio from the instrument panel ⇒ Communication; Rep. Gr. 91 ; Radio equipment .
- Remove the lower centre frame ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .
- Remove screws.



- Detach the control cables -1- from the mechanism -2- for ventilation and heating control.
- Disconnect the connectors.
- Remove the ventilation control mechanism.



1.10.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Tighten the fastening screw to a torque of 1.5 Nm.



Note

When installing the control cables on the ventilation control mechanism, they shall be placed in a certain position one from another, which is:

Temperature command cable:

- Turn the temperature control cable completely to the right, turn the temperature control button completely to the left and then connect them.

Air distribution command cable:

- Position the air distribution command button to the demister and with the air ventilation turned on, turn the command cable until full ventilation to the demister (windshield) is obtained and then connect it.



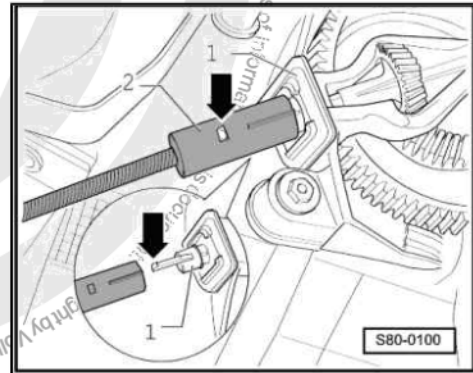
1.11 Configuration of ventilation control mechanism connectors

The pin configuration of the ventilation control mechanism connectors is described in the electrical diagrams ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.

1.12 Command cables - remove and install

1.12.1 Removal

- Remove the ventilation adjustment mechanism ⇒ [page 9](#) .
- Press the locking device -arrow- of the actuator mechanism -1- with a screwdriver and remove the cable -2-.



1.12.2 Installation

- Introduce the cable until the command mechanism lock secures.
- Install the ventilation system control mechanism ⇒ [page 9](#) .
- Check the functioning of the ventilation system.

The ventilation control mechanism control cable will be properly installed if, in the "Defrost" or Windshield Defog positions, no air leaves the footwell air ducts.

If this does not occur, turn the drive button half-a-turn (180°) and reinstall the control cable.

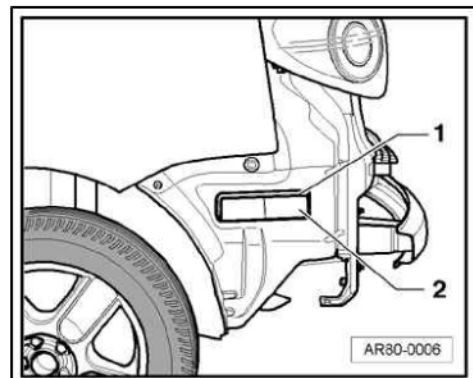
1.13 Air ventilation - check

Saturated air leaves the exhaust openings -2- located on the rear panel, under the bumper.

For the ventilation system to work perfectly, these exhaust openings must not be clogged.

Ventilation openings have a cover -1- which opens and closes automatically.

- Check that exhaust opening covers are working correctly, and replace them as necessary.





2 Heating - cabin components (as from model-year 2011)



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.*
- ◆ *When the Battery -A-, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.*

1 - Demisting baffle

- ☐ Remove only after the instrument panel has been removed ➔ Body - internal mountings; Rep. Gr. 70; Lining / Insulation

2 - Side air baffles

- ☐ Remove and install
➔ [page 15](#)

3 - Demister nozzle

- ☐ Remove and install
➔ [page 17](#)

4 - Right air duct

- ☐ For the right air baffle on the dash ➔ Body - internal mountings; Rep. Gr. 70; Lining / Insulation

5 - Left air duct

- ☐ For the left air baffle on the dash ➔ Body - internal mountings; Rep. Gr. 70; Lining / Insulation

6 - Air distributor for baffles

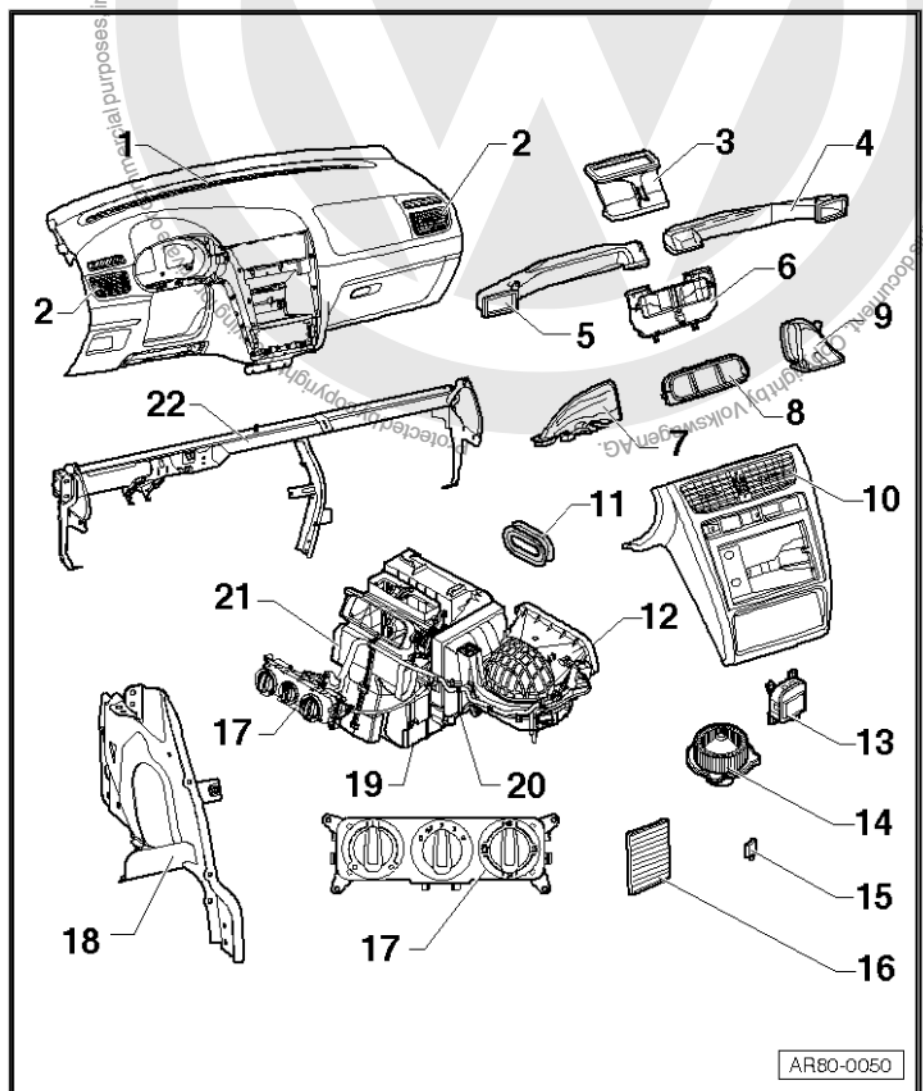
- ☐ Remove and install
➔ [page 17](#)

7 - Front left air duct in the foot-well

- ☐ Remove and install
➔ [page 17](#)

8 - Middle air duct

- ☐ Remove and install
➔ [page 17](#)





9 - Front right air duct for the footwell

- ☐ Remove and install ⇒ [page 17](#)

10 - Lower central frame

- ☐ With integrated central air baffles.
- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

11 - Sealing

- ☐ Observe the installation position ⇒ [page 12](#)
- ☐ Replace if damaged

12 - Air intake duct housing

13 - Control motor for the fresh air valve and the recirculation valve -V154-

- ☐ For vehicles with air conditioning only
- ☐ Remove and install ⇒ [page 46](#)

14 - Fresh air fan -V2-

- ☐ Remove and install ⇒ [page 13](#)

15 - Fresh air fan pre-resistor with overheating fuse -N24-

- ☐ Remove and install ⇒ [page 14](#)

16 - Dust and pollen filter

- ☐ Remove and install ⇒ [page 14](#)

17 - Ventilation adjustment mechanism

- ☐ Remove and install ⇒ [page 19](#)

18 - Left mounting of transverse support

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

19 - Dust and pollen filter compartment

20 - Heat exchanger compartment

21 - Plenum chamber (heating)

- ☐ Remove and install ⇒ [page 25](#)

22 - Transverse support

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

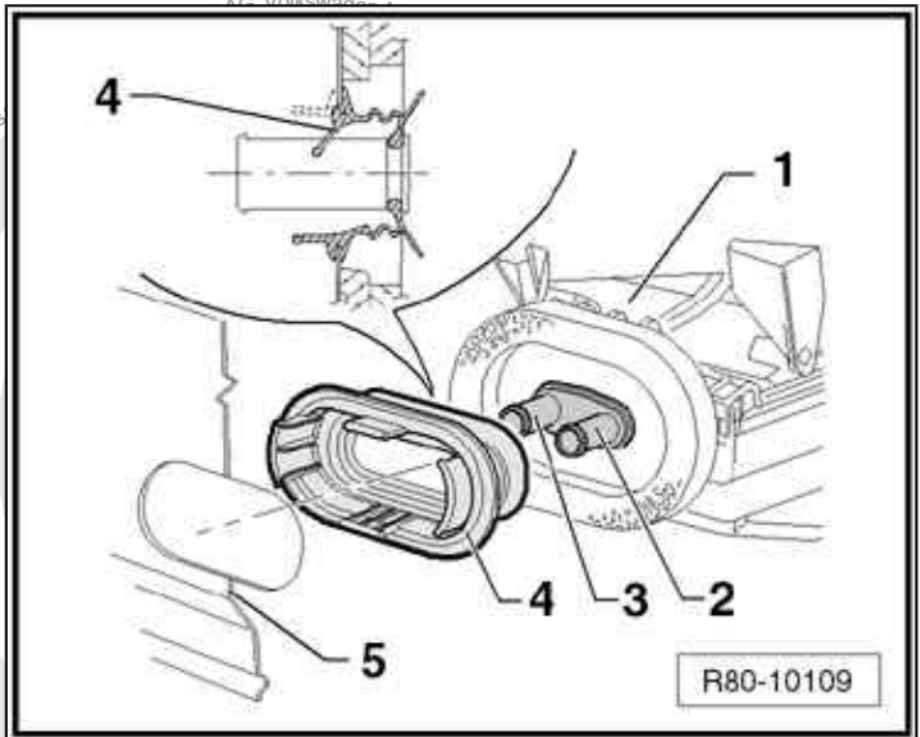
2.1 Heat exchanger/engine compartment partition panel sealing

For vehicles equipped with ventilation/heating system.

- ♦ Vehicles with air conditioning system ⇒ [page 63](#) .



- 1 - Plenum chamber (heating)
- 2 - Heat exchanger intake duct
 - ❑ Heat exchanger - remove and install
⇒ [page 47](#)
- 3 - Heat exchanger outlet duct
 - ❑ Heat exchanger - remove and install
⇒ [page 47](#)
- 4 - Heat exchanger sealing
 - ❑ Replace, if damaged
- 5 - Engine compartment partition panel



WARNING

Observe the correct installation of intake -2- and outlet -3- coolant hoses in the heat exchanger.

2.2 Fresh air fan -V2-

2.2.1 Fresh air fan -V2- - remove and install

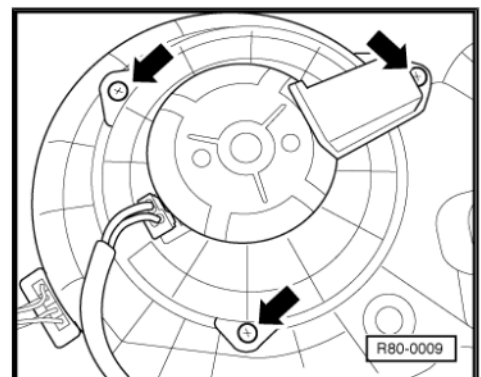
Removal:

- Remove the object tray ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Disconnect the fan connector.
- Remove the attaching screws -arrows- and remove the Fresh air fan -V2- from housing.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- ◆ The Fresh air fan -V2- is different for the heating and air conditioning equipment - check the part number.
- ◆ The connector must be connected correctly.
- ◆ Tighten the fastening screws with 1 Nm of torque.
- ◆ Check that the fan is in working order after installation.





2.3 Fresh air fan pre-resistor with overheating fuse -N24-

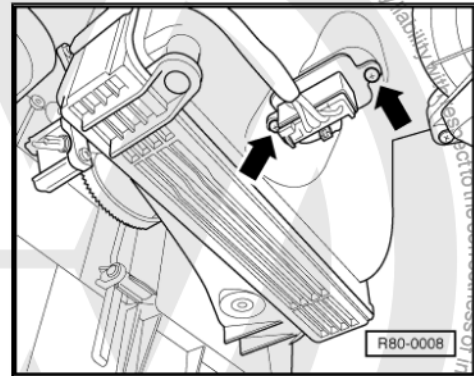
2.3.1 Fresh air fan pre-resistor with overheating fuse -N24- - remove and install

Removal:

- Disconnect the connector.
- Loosen the fastening screws -arrows- and remove the Fresh air fan pre-resistor with overheating fuse -N24- .

Installation:

Installation is carried out in the reverse order of removal.



2.4 Dust and pollen filter

2.4.1 Dust and pollen filter -remove and install

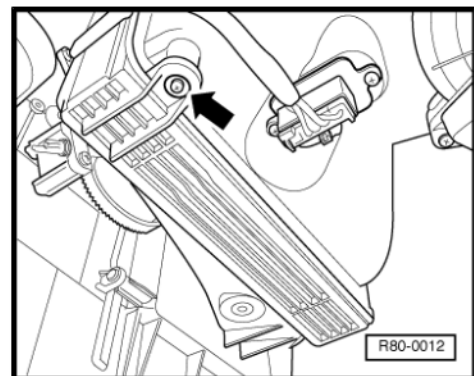


Note

The dust and pollen filter is located on the lower right side, under the instrument panel.

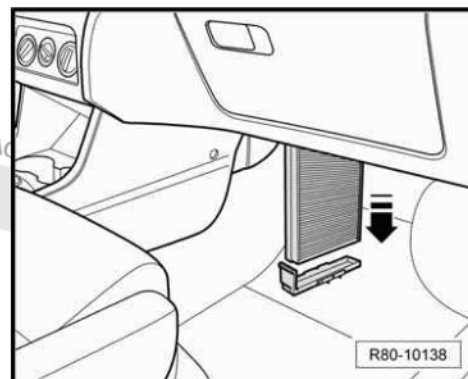
Removal:

- Remove fixing screws -arrow- from the dust and pollen filter cover.





- Remove the dust and pollen air cleaner observing the arrow indication.

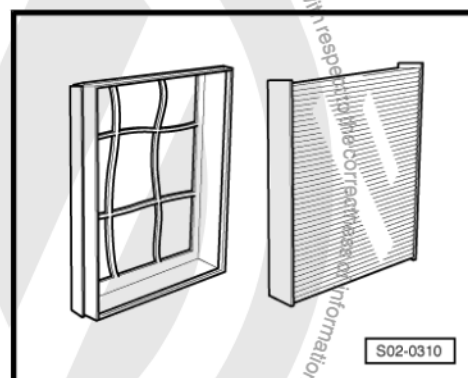


- Remove the filtering element from framework.

Installation:

Install by inverting the removal sequence, paying attention to the following:

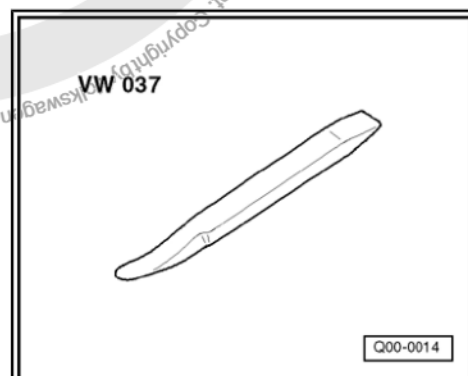
- Check the filtering element installation position in the framework.



2.5 Air baffles

Special tools and workshop equipment required

- ◆ Spatula -VW 037- .



2.5.1 Air baffles (sides) - remove and install

Removal of air baffle (right side):

- Unslot the side cover (right side) from the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation , in order to gain access to the rear section of the air baffle.



- Carefully unslot and remove the air baffle (right side) with the Spatula -VW 037- .

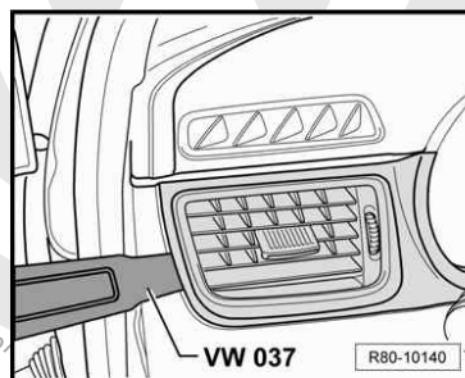
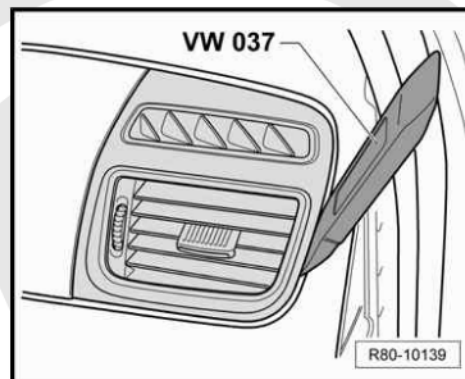
Removal of air baffle (left side):

- Unslot the side cover (left side) from the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation , in order to gain access to the rear section of the air baffle .
- Remove the Combined instrument -K- ⇒ Electrical equipment; Rep. Gr. 90 ; Instrument case, indicators .

- Carefully unslot and remove the air baffle (right side) with the Spatula -VW 037- .

Installation:

Installation is carried out in the reverse order of removal.



2.5.2 Air baffle (central) - remove and install



Note

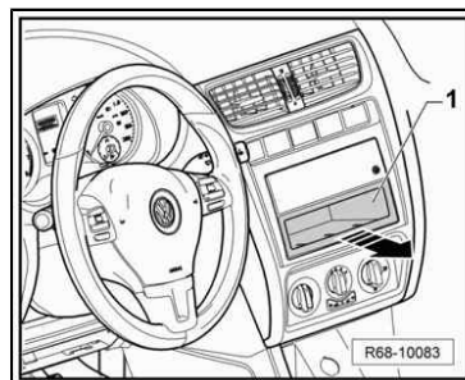
The air baffles (central) are integrated with the central frame of the instrument panel.

Removal:

- Remove the object tray -1- towards the arrow ⇒ Body - internal mountings; Rep. Gr. 68 ; Internal equipment .
- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. Gr. 91 ; Radio equipment .
- Remove instrument panel switches ⇒ Electrical equipment; Rep. Gr. 96 ; Switches, lights and internal bulbs, alarm .
- Remove the central frame of the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .

Installation:

Installation is carried out in the reverse order of removal.





2.6 Footwell air duct

2.6.1 Footwell air duct (front left) - remove and install



Note

The footwell air duct (front left) is located in the lower left side of the instrument panel, near the brake and accelerator pedals.

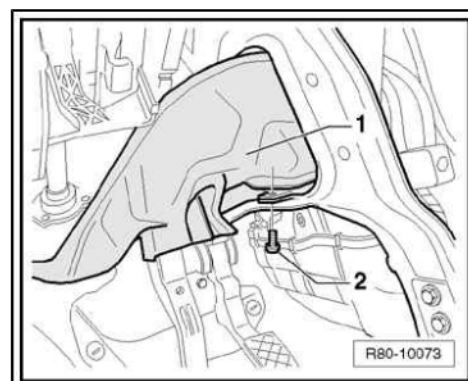
Removal:

- Remove fixing screws -2-.
- Remove the air duct -1- to the footwell.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Tighten the fastening screw -2- with 1.5 Nm of torque.



2.6.2 Footwell air duct (front right) - remove and install



Note

The footwell air duct (front right) is located on the lower right side of the instrument panel, behind the glove compartment.

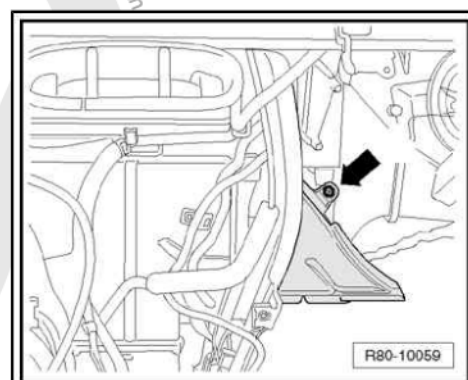
Removal:

- Remove the glove compartment on the passenger side ⇒ Body - internal mountings; Rep. Gr. 68 ; Internal equipment .
- Remove fixing screws -arrow-.
- Remove footwell air duct.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Tighten the fastening screw -arrow- with a torque of 1.5 Nm.

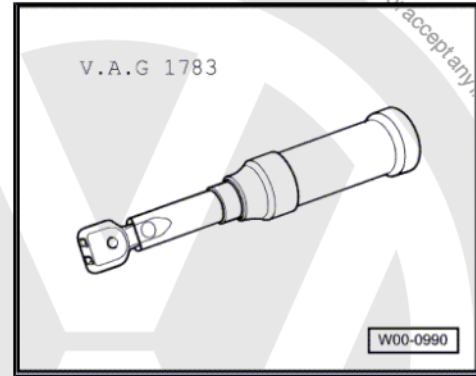


2.7 Demister nozzle and air distributor for central baffles

Special tools and workshop equipment required



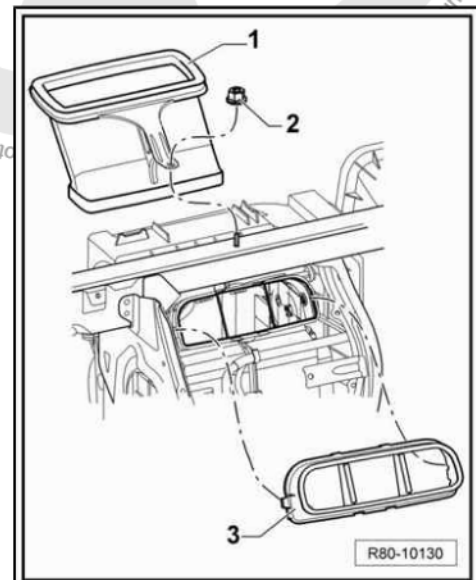
- ◆ Torque wrench 2 to 10 Nm -VAG 1783-



2.7.1 Demister nozzle and air distributor for central baffles - remove and install

Removal:

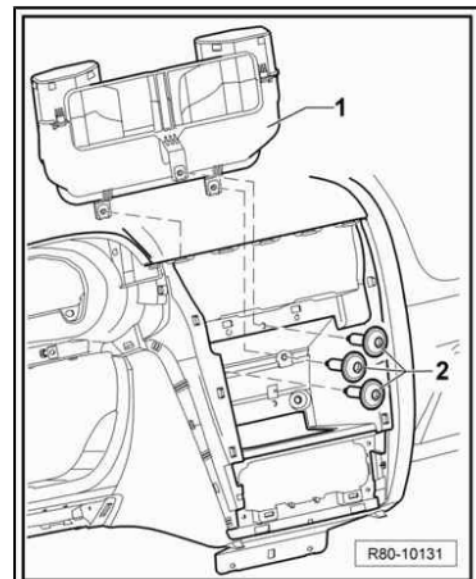
- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the hexagonal nut -2- and remove the demister nozzle -1-.
- Unslot and carefully remove the intermediate duct of the air baffles -3-.



- Loosen the fastening screws -2-.
- Remove the air distributor to the baffles -1-.

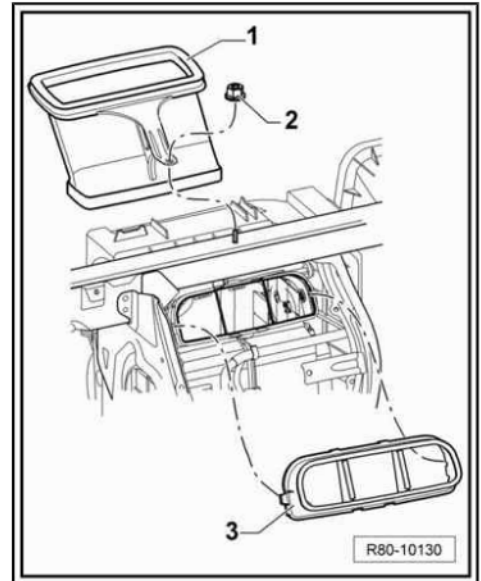
Installation:

Install by inverting the removal sequence, paying attention to the following:





- Tighten the hex nut -2- with a torque of 6 Nm.



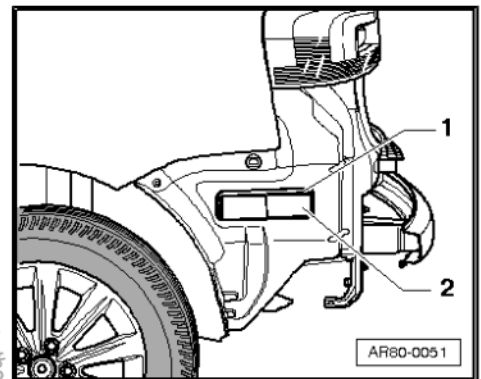
2.8 Air ventilation - check

Saturated air leaves the exhaust openings -2- located on the rear panel, under the bumper.

For the ventilation system to work perfectly, these exhaust openings must not be clogged.

Ventilation openings have a cover -1- which opens and closes automatically.

- Check that exhaust opening covers are working correctly, and replace them as necessary.



2.9 Ventilation adjustment mechanisms

2.9.1 Ventilation adjustment mechanism - remove and install

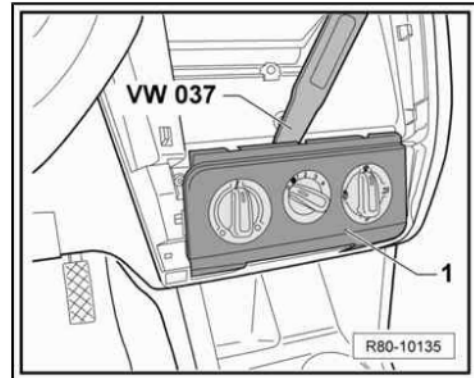
Ventilation adjustment mechanism, heating and air conditioning

Removal:

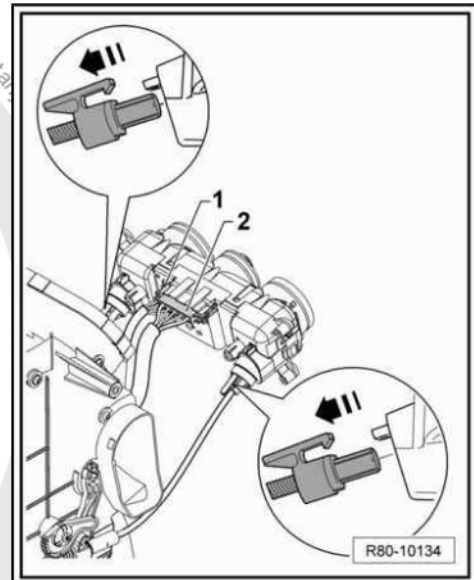
- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. Gr. 91 ; Radio, telephone, navigation system .
- Remove the central frame of the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining, Insulation .



- Carefully remove the frame from the ventilation adjustment mechanism -1-, using the Spatula -VW 037- .



- Pull off connectors -1 and 2- from the from the ventilation adjustment mechanism.
- Press the locks and remove the command cables in the direction -arrow-.



- Remove the attaching screws -1-.
- Remove the ventilation adjustment mechanism -2-.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Tighten the fastening screws -1- of ventilation adjustment mechanism to a torque of 1.5 Nm.



Note

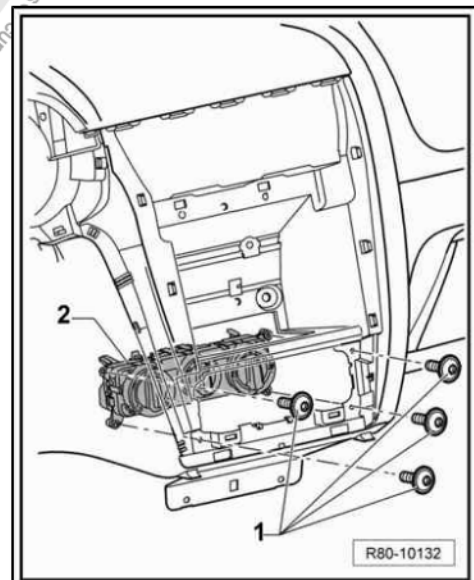
When installing the control cables in the ventilation control mechanism, carefully observe the following installation instructions:

Temperature command cable:

- Turn temperature adjustment command cable all the way to the right, adjust command button for temperature adjustment all the way to the left, and connect the cable.

Air distribution command cable:

- Position the air distribution command button to the demister and with the air ventilation turned on, turn the command cable until full ventilation to the demister (windshield) is obtained and then connect it.





2.9.2 Ventilation / heating adjustment mechanism power connectors

Removal and installation of the ventilation control unit

⇒ [page 19](#) .

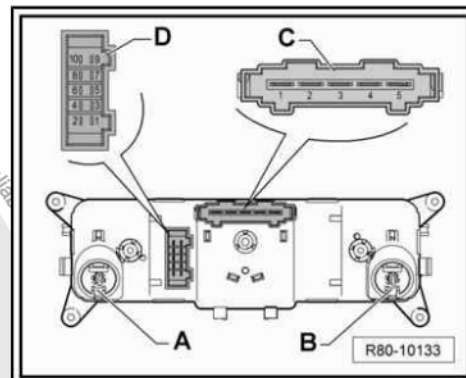
Position of the connectors in the rear section of the ventilation / heating adjustment mechanism:

- A- Air distribution command cable.
- B- Temperature adjustment command cable.
- C- Housing for 5-pole supply connector.
- 1- 4° Ventilation speed.
- 2- 3° Ventilation speed.
- 3- 2° Ventilation speed.
- 4- 1° Ventilation speed.
- 5- Terminal -X- contact.
- D- Housing for 10-pole supply connector.
- 5- Terminal 31.
- 9- Terminal 58s.



Note

The correct position of the connector pins in the ventilation adjustment mechanisms can also be found in the electrical diagrams
⇒ *Current flow diagrams, Electrical fault finding and Fitting locations.*

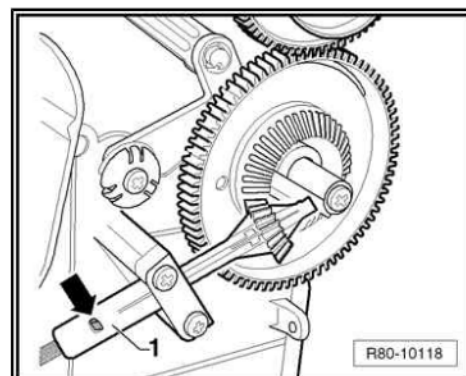


2.10 Command cables

2.10.1 Command cables - remove and install

Removal:

- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. Gr. 91 ; Radio, telephone, navigation system .
- Remove the lower centre frame ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the ventilation adjustment mechanism ⇒ [page 19](#) .
- Press the slotting lock with a screwdriver -arrow- and remove the air distribution command cable -1-.





- Press the slotting lock with a screwdriver -arrow- and remove the temperature adjustment command cable -1-.

Installation:

Install by inverting the removal sequence, paying attention to the following:



Note

When installing command cables in the ventilation adjustment mechanism, carefully follow the following installation orders for individual cables:

Temperature command cable:

- Turn temperature adjustment command cable all the way to the right, adjust command button for temperature adjustment all the way to the left, and connect the cable.

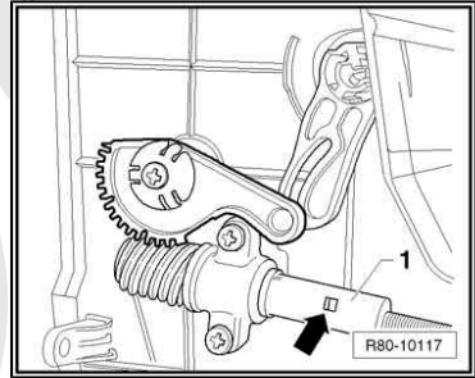
Air distribution command cable:

- Position the air distribution command button to the demister and with the air ventilation turned on, turn the command cable until full ventilation to the demister (windshield) is obtained and then connect it.

Verifying the correct working order of the ventilation system:

The ventilation control mechanism control cable will be properly installed if, in the "Defrost" or Windshield Defog positions, no air leaves the footwell air ducts.

If this does not occur, turn the drive button half-a-turn (180°) and reinstall the control cable.





3 Plenum chamber (up to model-year 2010) - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the battery earth strap.*
- ◆ *When the battery is reconnected, check the operation of the vehicle electrical system (radio, clock and electric door and window locks, etc.) according to the Workshop Manual and/or instructions for use.*

3.1 Plenum chamber - remove and install

- 1 - Dust and pollen filter
 - ☐ Remove and install
➔ [page 5](#)
- 2 - Hexagon combination screw
 - ☐ 2 units
 - ☐ 12 Nm
- 3 - Air distribution command cable
 - ☐ Remove and install
➔ [page 10](#)
- 4 - Temperature command cable
 - ☐ Remove and install
➔ [page 10](#)
- 5 - Heat exchanger
 - ☐ Remove and install
➔ [page 36](#)
- 6 - Left side of the transverse bracket
 - ☐ Remove and install ➔
Body - internal mountings; Rep. Gr. 70; Instrument panel - remove and install
- 7 - Hexagon combination screw
 - ☐ 2 units
 - ☐ 12 Nm



8 - Hexagon combination screw

- ☐ 2 units
- ☐ 12 Nm

9 - Torx screw T 20

- ☐ 3 units
- ☐ 5 Nm

10 - Heat exchanger seal and bulkhead partition of the engine compartment

- ☐ Observe the installation position ⇒ [page 3](#)
- ☐ Replace if damaged

11 - Evaporator

3.1.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings;
Rep. Gr. 70 ; Instrument panel - remove and install .
- Close the coolant hoses in engine compartment with Clamps
(diam. 25 mm) -3094- .

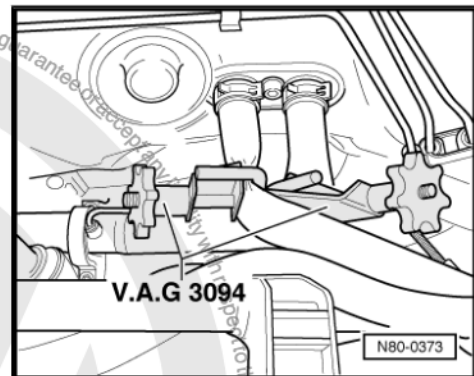


WARNING

Risk of burns!

When the engine is hot, the refrigerant temperature might be higher than 100°C. The cooling system is under pressure.

Before starting any work, reduce pressure and temperature, if necessary.



- Loosen the clamps with Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. Place a container to collect coolant on the other outlet.
- Remove the refrigerant from the heat exchanger with a compressed air gun.
- Remove the right support of the panel bracket.
- Remove the remaining fastening screws.
- Remove the air intake case of the panel bracket and disconnect harnesses and connectors from the air intake case.
- Remove the plenum chamber.

3.1.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Reassemble the harnesses and all the connectors in their original positions.
- Check the refrigerant level and refill, if necessary.



4 Plenum chamber (as from model-year 2011) - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- → Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.


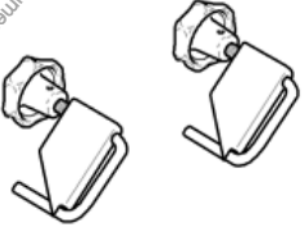
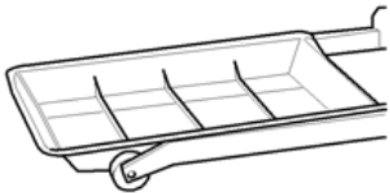
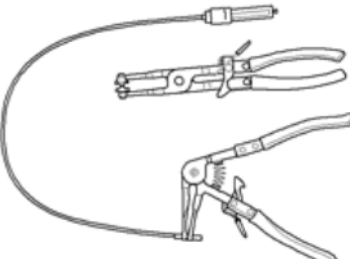
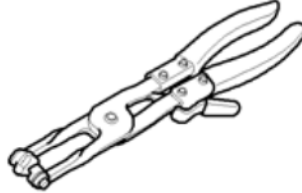


Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.
- ◆ When the Battery -A-, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

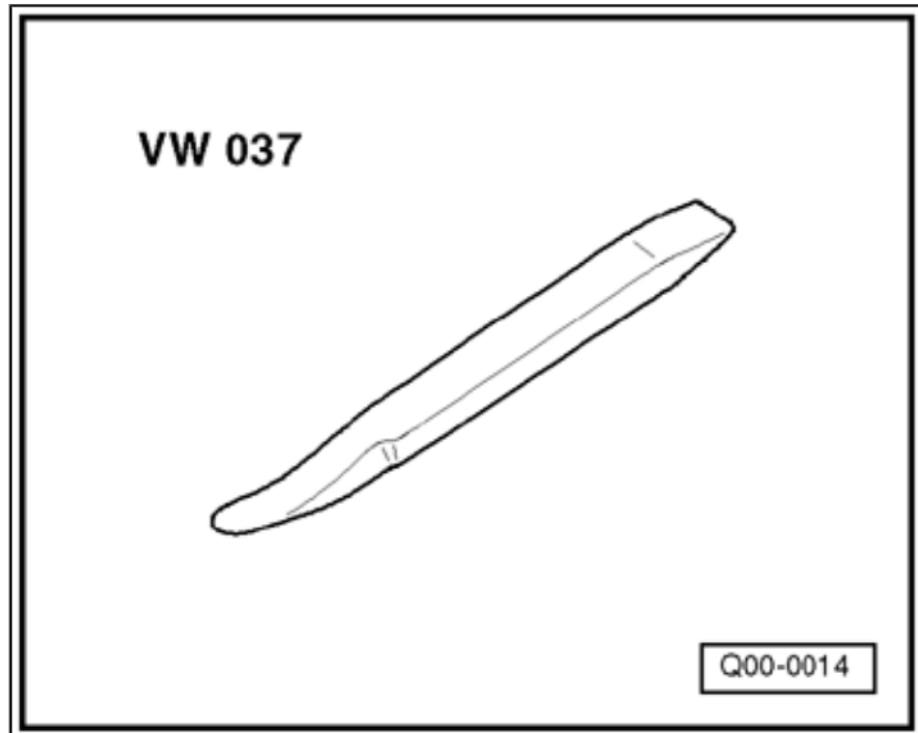
Special tools and workshop equipment required

- ◆ Torque wrench -5 to 50 Nm (socket 1/2") -VAG 1331-
- ◆ Clamps (diam. 25 mm) -3094-
- ◆ Drip tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 or VAS 5024A-
- ◆ Standard-type clamp pliers -VW 5163-

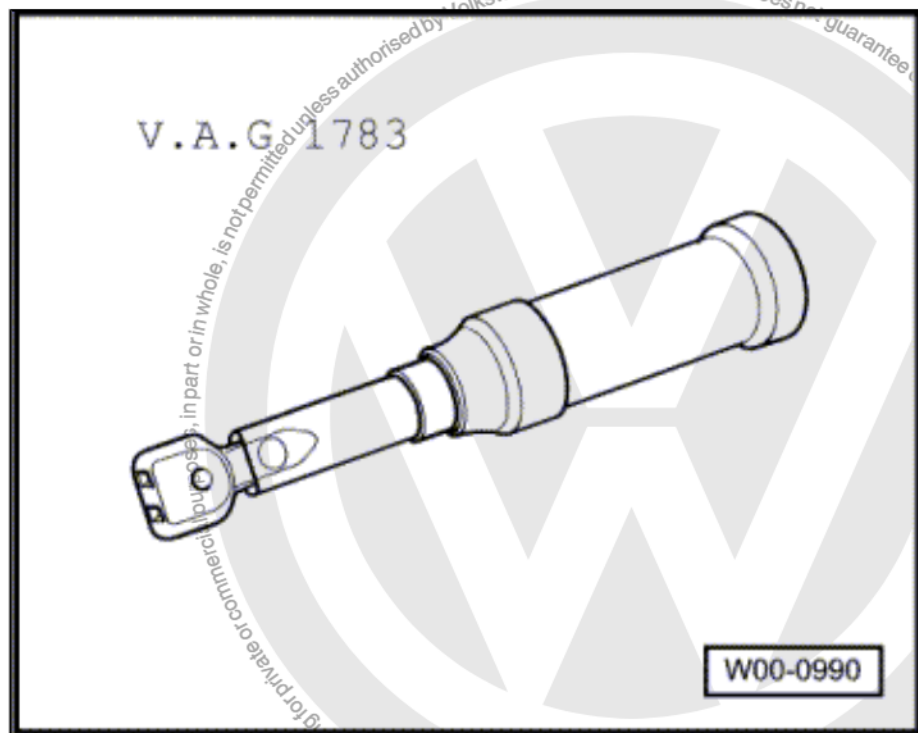
<p>VAG 1331</p> 	<p>3094</p> 
<p>VAG 1306</p> 	<p>VAS 5024A</p> 
<p>VW 5163</p> 	<p>Q87-10005</p>



◆ Spatula -VW 037-



◆ Torque wrench 2 to 10 Nm
-VAG 1783-





4.1 Plenum chamber - remove and install

1 - Transverse support

- ☐ Remove and install ⇒
Body - internal mount-
ings; Rep. Gr. 70 ; Lin-
ing / Insulation .

2 - Heat exchanger sealing

- ☐ Observe the installation
position ⇒ [page 63](#)
- ☐ Replace if damaged

3 - Screw

- ☐ 2 units
- ☐ 12 ± 1.2 Nm

4 - Dust and pollen filter com- partment

- ☐ Dust and pollen filter -
remove and install
⇒ [page 14](#)

5 - Heat exchanger compart- ment

- ☐ Heat exchanger - re-
move and install
⇒ [page 47](#)

6 - Air distribution command cable

- ☐ Remove and install
⇒ [page 21](#)

7 - Left mounting of transverse support

- ☐ Remove and install ⇒
Body - internal mount-
ings; Rep. Gr. 70 ; Lin-
ing / Insulation

8 - Screw

- ☐ 4 units
- ☐ 12 ± 1.2 Nm

9 - Screw

- ☐ 2 units
- ☐ 12 Nm

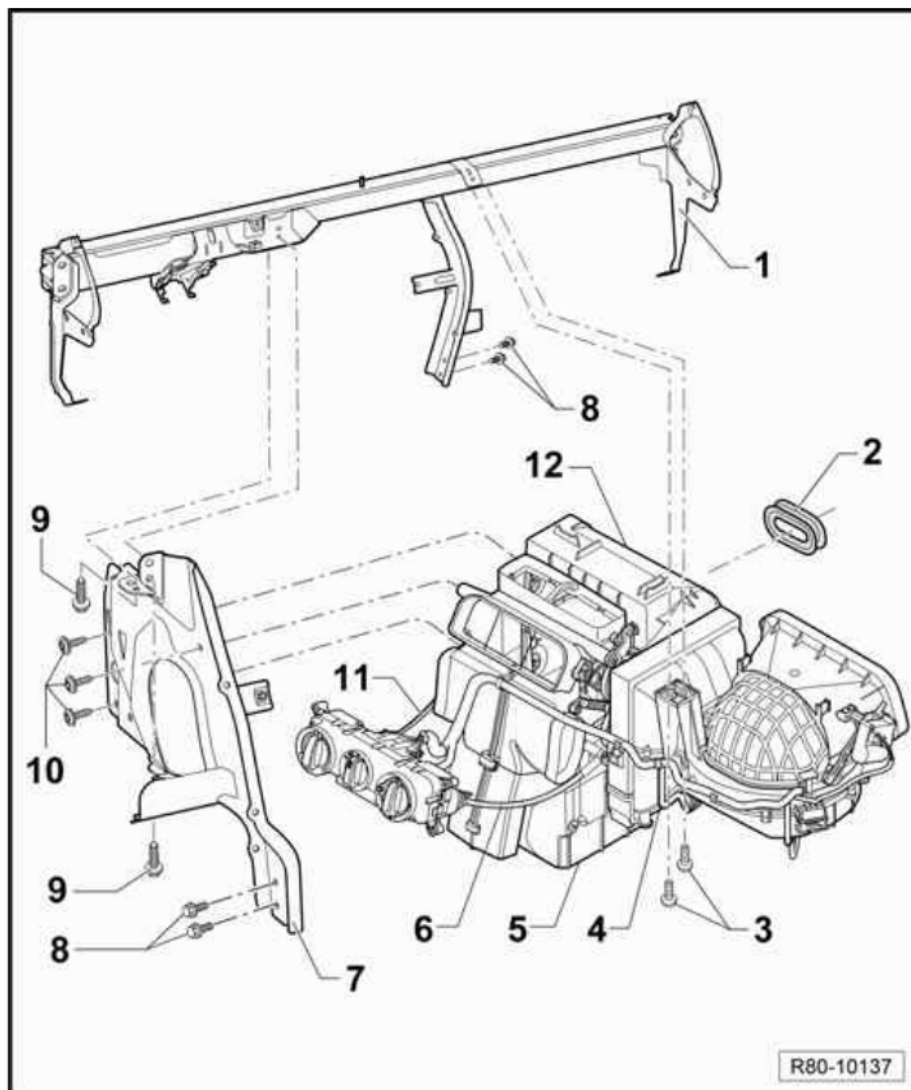
10 - Screw

- ☐ 3 units
- ☐ 5 ± 0.5 Nm

11 - Temperature command cable

- ☐ Remove and install ⇒ [page 21](#)

12 - Evaporator compartment



R80-10137



4.1.1 Removal



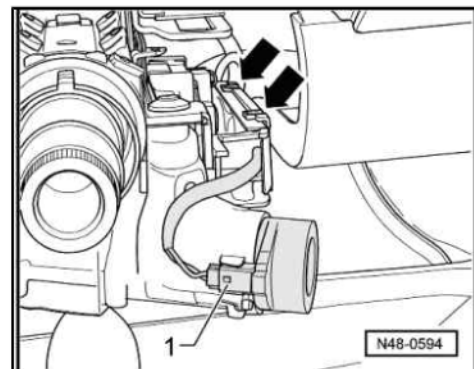
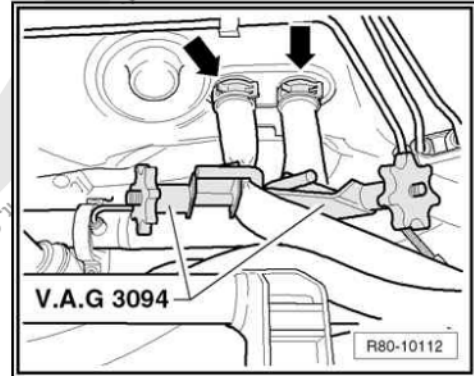
WARNING

Risk of burns!

When the engine is hot, the refrigerant temperature might be higher than 100 °C. The cooling system is under pressure.

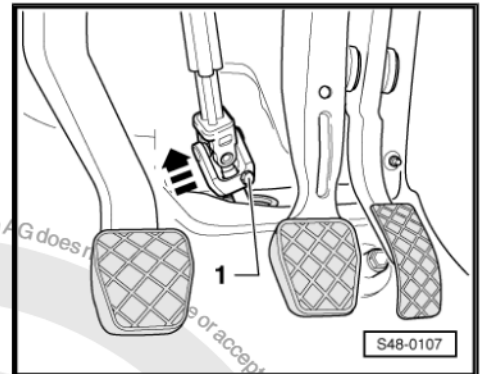
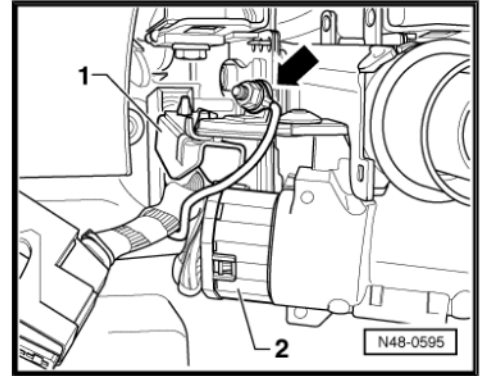
Before starting any work, reduce pressure and temperature, if necessary.

- Close the coolant hoses in engine compartment with Clamps (diam. 25 mm) -3094- .
- Release the clamps -arrows- with Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. Place a container to collect coolant on the other outlet.
- With a compressed air gun, remove coolant from the heat exchanger.
- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .
- Remove the Combined instrument -K- ⇒ Electrical equipment; Rep. Gr. 90 ; Instrument case, indicators .
- Remove the Radio -R- or "CD player" -R89- from the instrument panel ⇒ Communication; Rep. Gr. 91 ; Radio equipment .
- Remove instrument panel switches ⇒ Electrical equipment; Rep. Gr. 96 ; Switches, lights and internal bulbs, alarm .
- Remove the central frame of the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the ventilation adjustment mechanism ⇒ [page 19](#) .
- Pull off steering wheel ⇒ Running gear, ??axles, ??steering; Rep. Gr. 48 ; Steering .
- Remove the steering column coverings ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the turn signal and wiper/washer switches ⇒ Electrical equipment; Rep. Gr. 94 ; Switches, lights and external lamps .
- Pull off connector -1- from the Immobilizer reading coil -D2- .
- Open the cable support (right side) in the tabs -arrows- and remove the wire.
- Disconnect the earth strap from the steering column -arrow-.

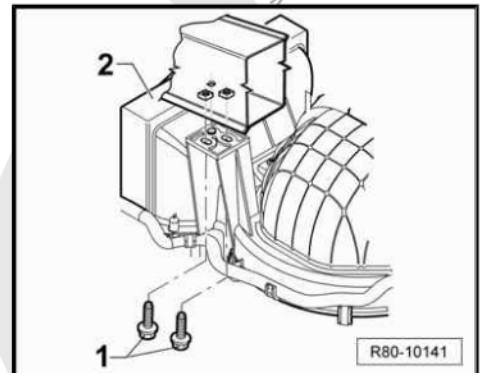




- Remove the earth strap and the support (left side) -1- from the switchbox cables.
- Disconnect the Ignition switch -D- -2- from the steering lock assembly.
- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove demister nozzle and air distributor to the central baffles ⇒ [page 17](#) .
- Remove front left footwell air duct ⇒ [page 17](#) .
- Remove front right footwell air duct ⇒ [page 17](#) .
- Remove fixing screws -1- from the universal joint and unhook the universal joint in the direction of the arrow ⇒ Running gear, ??axles, ??steering; Rep. Gr. 48 ; Steering .



- Loosen the fastening screws -1- from the plenum chamber -2-.
- Remove the transversal support ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the supports (right and left) from the dash support ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Carefully separate the plenum chamber from the dash and disconnect the connectors from the plenum chamber.
- Remove the plenum chamber.



4.1.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Reassemble the harnesses and all the connectors in their original positions.



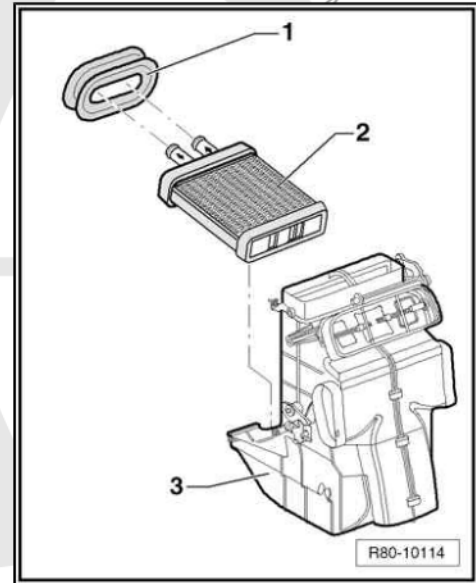
- Observe the installation position of the seal -1- and of the heat exchanger hoses -2- ➔ [page 12](#) .



Note

After removal or replacement of heat exchanger, the cooling system will contain air; to remove the air, proceed as follows:

- Start the engine and keep it revved at 2500 rpm until coolant level in the tank lowers after the thermostat valve opens (the air that was in the heat exchanger is moved to the coolant tank, causing the coolant level there to decrease).
- Top up coolant tank ➔ Engine; Rep. Gr. 19 ; Cooling system .





5 Plenum chamber (up to model-year 2010) - remove and install

1 - Heater equipment wiring harness

2 - Upper section of the plenum chamber

3 - Support

- ☐ Fixed on the transverse bracket and heat exchanger

4 - Fresh air fan pre-resistor with overheating fuse -N24-

- ☐ Remove and install
⇒ [page 4](#)

5 - Air inlet nozzle

- ☐ With fresh air and recirculation air flap

6 - Sealing

- ☐ Replace if damaged

7 - Lower section of the plenum chamber

8 - Control motor for the fresh air valve and the recirculation valve -V154-

- ☐ Remove and install
⇒ [page 34](#)

9 - Support

10 - Fresh air fan -V2-

- ☐ Remove and install
⇒ [page 3](#)

11 - Fan case

12 - Dust and pollen filter cover

13 - Dust and pollen filter

- ☐ Remove and install ⇒ [page 5](#)

14 - Air distribution command mechanism

- ☐ Remove and install ⇒ [page 32](#)

15 - Lower section of the plenum chamber

16 - Auxiliary heating resistor -Z35-

- ☐ Only for diesel engine vehicles
- ☐ Remove and install ⇒ [page 37](#)

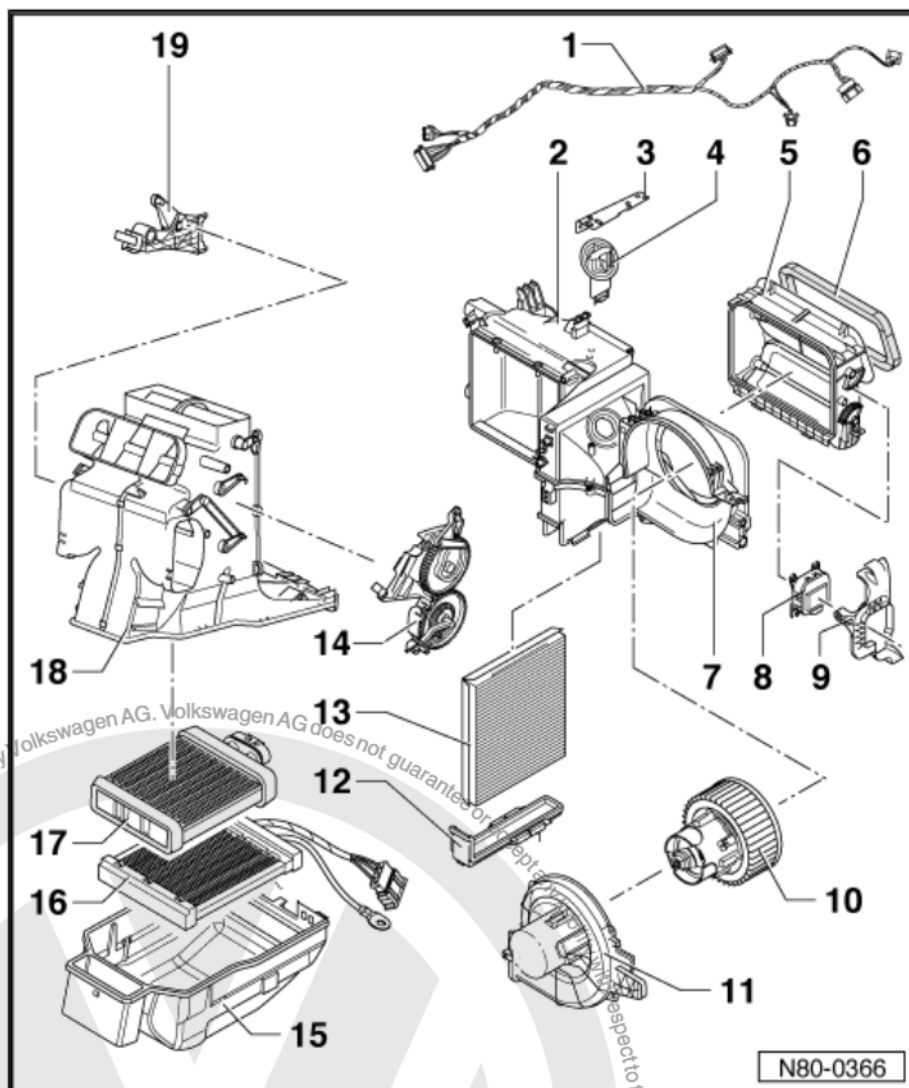
17 - Heat exchanger

- ☐ Remove and install ⇒ [page 36](#)

18 - Upper part of the air intake case

19 - Temperature control mechanism

- ☐ Remove and install ⇒ [page 33](#)

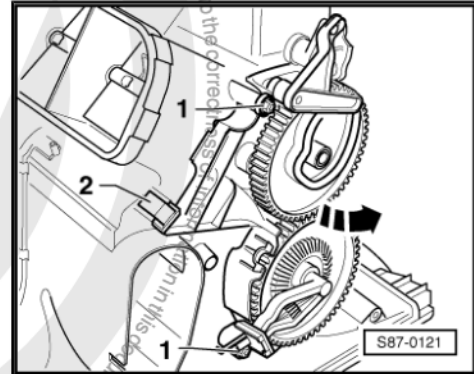




5.1 Air distribution operating mechanism - remove and install

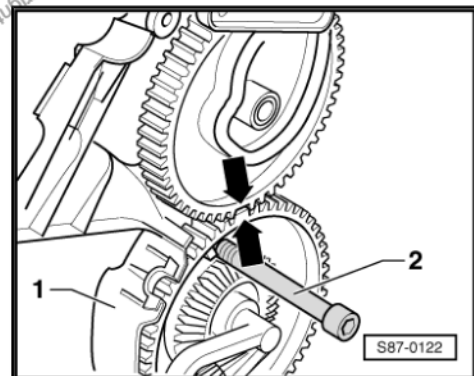
5.1.1 Removal

- Remove plenum chamber ⇒ [page 23](#) .
- Remove the upper part of the air intake case.
- Remove the attaching screws -1-.
- Release the locks -2- and remove control mechanism observing the direction of the arrow.



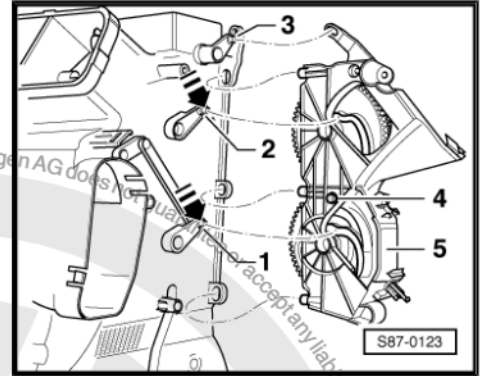
5.1.2 Installation

- Lock the gears of the command mechanism. To do this, turn the gears until the -arrows- align with each other.
- In this position, fit an M6 screw -2- in the opening of the lower gear with the control mechanism-1-.





- Place the footwell opening flap lever -1- down.
- Position instrument panel flap lever -2- down.
- Position windshield defogger opening lever -3- in a way to fully open the flap.
- Install the control mechanism locking it in -5- the three holes in the plenum chamber.
- Move the control mechanism to engage the lever pins -1- and -2- in the corresponding rails of the control mechanism -5-.
- Introduce the support pin -3- in the corresponding opening of the control mechanism -5-.



Note

During installation, the lever pin -1- can be seen from outside through an opening in the lower gear of the adjustment unit.

- Lock the command mechanism and remove the screw -4-.
- Check the functioning of the command mechanism.

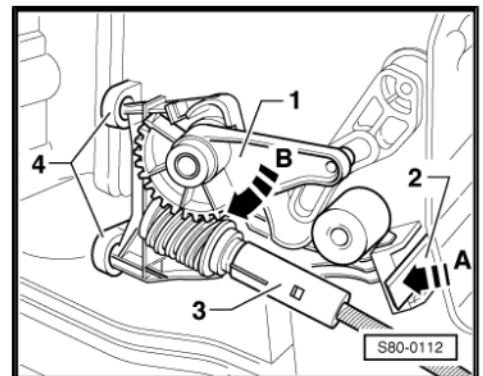
All flaps shall move easily and without bumps, otherwise, remove the mechanism and repeat the installation.

- Tighten the screws to 1 Nm.

5.2 Temperature adjustment mechanism - remove and install

5.2.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install ⇒ [page 10](#) .
- Remove the front left footwell air duct ⇒ [page 7](#) .
- Remove the control cable -3- from the adjustment mechanism ⇒ [page 10](#) .
- Release the lock -2- pressing it toward -arrow A-.
- Move the adjustment mechanism -1- in the direction of -arrow B- and remove the supports -4-.



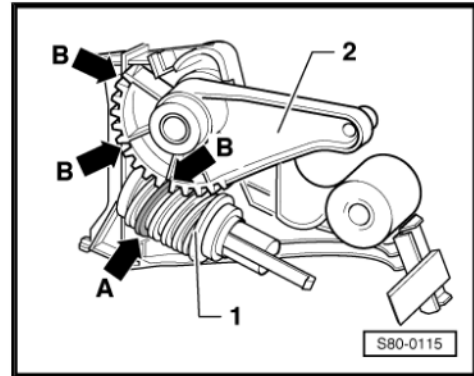


5.2.2 Installation

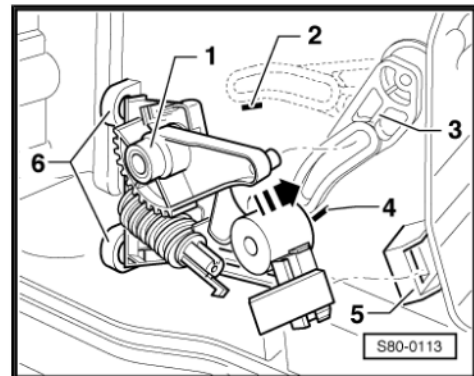


Note

- ♦ Before installing, check that the position of the worm screw -1- and gear segment -2- match up.
- ♦ The bigger thread, identified by the darker color, -arrow A- should fit into the deeper tooth intervals -arrow B-.



- Mark the lever position -3- with the temperature adjustment hatch in the end positions (flap completely open -2- and flap fully closed -4-) in the plenum chamber.
- Place the adjustment mechanism -1- in the flap fully closed position -4-.
- Place the temperature lever -3- in its fully downward position.
- Install the adjustment mechanism -1- on support -6- and fit the pin in the lever rail -3-.
- Insert the lock -5- of the adjustment mechanism in the plenum chamber.
- Move the temperature button in the "Cold position" and install the control cable in the adjustment mechanism -1-.
- Check the functioning of the control mechanism.



All flaps shall move freely and without bumps, otherwise, remove the mechanism and repeat the installation.

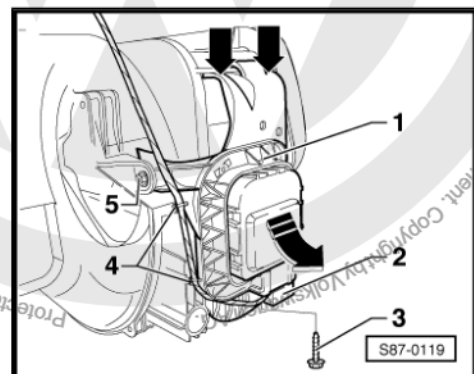
Assure easy movement without jolts of the temperature flap to its end positions (Marks -2- and -4- if that is not possible, remove the mechanism and repeat the installation.

- Install the front left footwell air duct ⇒ [page 7](#).
- Install the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .

5.3 Control motor for the fresh air valve and the recirculation valve -V154- - remove and install

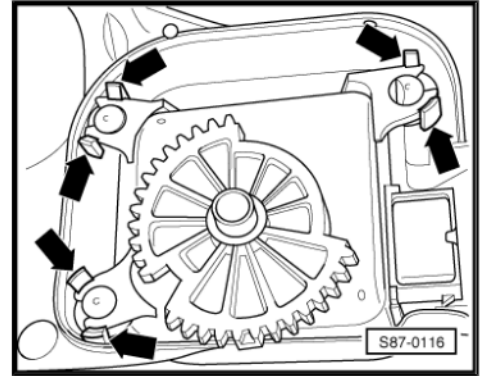
5.3.1 Removal

- Remove the Fresh air fan -V2- ⇒ [page 4](#).
- Carefully cut the cable fastenings -4-.
- Remove screws -3- and -5-.
- Pull off connector -2-.
- Press the locks and remove the support with the Control motor for the fresh air valve and the recirculation valve -V154- -1- towards the arrow.





- Press the support locks outward -arrows- and remove the Control motor for the fresh air valve and the recirculation valve -V154- from the support.



5.3.2 Installation

Install by inverting the removal sequence, paying attention to the following:

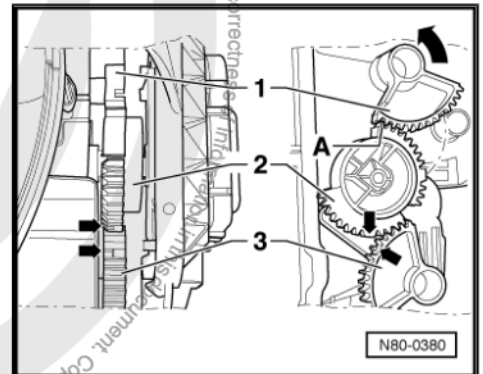


Note

- ◆ *The Control motor for the fresh air valve and the recirculation valve -V154- is different for the heating and air conditioning systems - check the part number!*
- ◆ *A new Control motor for the fresh air valve and the recirculation valve -V154- is supplied in the end position "air circulation operation".*

The following work steps must be performed simultaneously:

- ◆ Close the cold air flap -arrow- and keep it closed.
- ◆ Position the Control motor for the fresh air valve and the recirculation valve -V154- in a way that the first tooth -A- of the gear -2- engages in the first gap of the gear segment -1- of the cold air flap.
- ◆ Position the air circulation flap in a way to engage the markings -arrows- the gear -2- and the gear segment -3- of the air circulation flap.
- ◆ Position the Control motor for the fresh air valve and the recirculation valve -V154- completely on the support.
- Install the screws -3- and -5-.
- Push on connector -2-.
- Switch on the ignition and check Control motor for the fresh air valve and the recirculation valve -V154- with the air circulation button.



Note

- ◆ *The cold air flap and the recirculated air flap shall move freely and without bumps to their final positions.*
- ◆ *Switch ignition off immediately if system is malfunctioning and repeat installation.*
- Check function with the Diagnosis, Measurement and Information System -VAS 5051A/52- ➔ [page 36](#).



5.4 Control motor for the fresh air valve and the recirculation valve -V154- - check

- Connect the Diagnosis, Measurement and Information System -VAS 5051A/52- .
- Select, on Diagnosis, Measurement and Information System -VAS 5051A/52- function Assisted Fault Pinpointing.
- Select the corresponding version, vehicle, model, year and engine and press Advance.

After consulting all command units, select the following functions:

- ◆ Advance
- ◆ Go to
- ◆ Selection of Functions/Components
- ◆ Body
- ◆ Heating, Ventilation and Air Conditioning
- ◆ Electrical components
- Continue selecting the functions you want in Diagnosis, Measurement and Information System -VAS 5051A/52- ⇒ Vehicle diagnosis, testing and information system VAS 5051.

5.5 Heat exchanger - remove and install

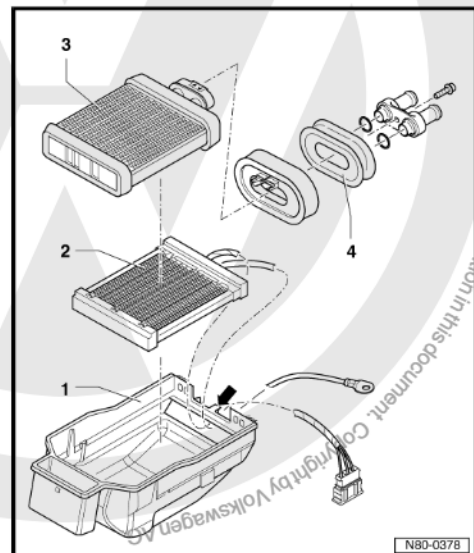
5.5.1 Removal

- Remove the air intake case:
- ◆ Vehicles with heating system only ⇒ [page 23](#) .
- ◆ Vehicles with heating and air conditioning systems ⇒ [page 55](#) .
- Loosen the locks and remove the lower part of the plenum chamber -1-.
- Remove the heat exchanger -3-.



Note

A Auxiliary heating resistor -Z35- -2- only exists for certain models. Removal and installation ⇒ [page 37](#) .



5.5.2 Installation

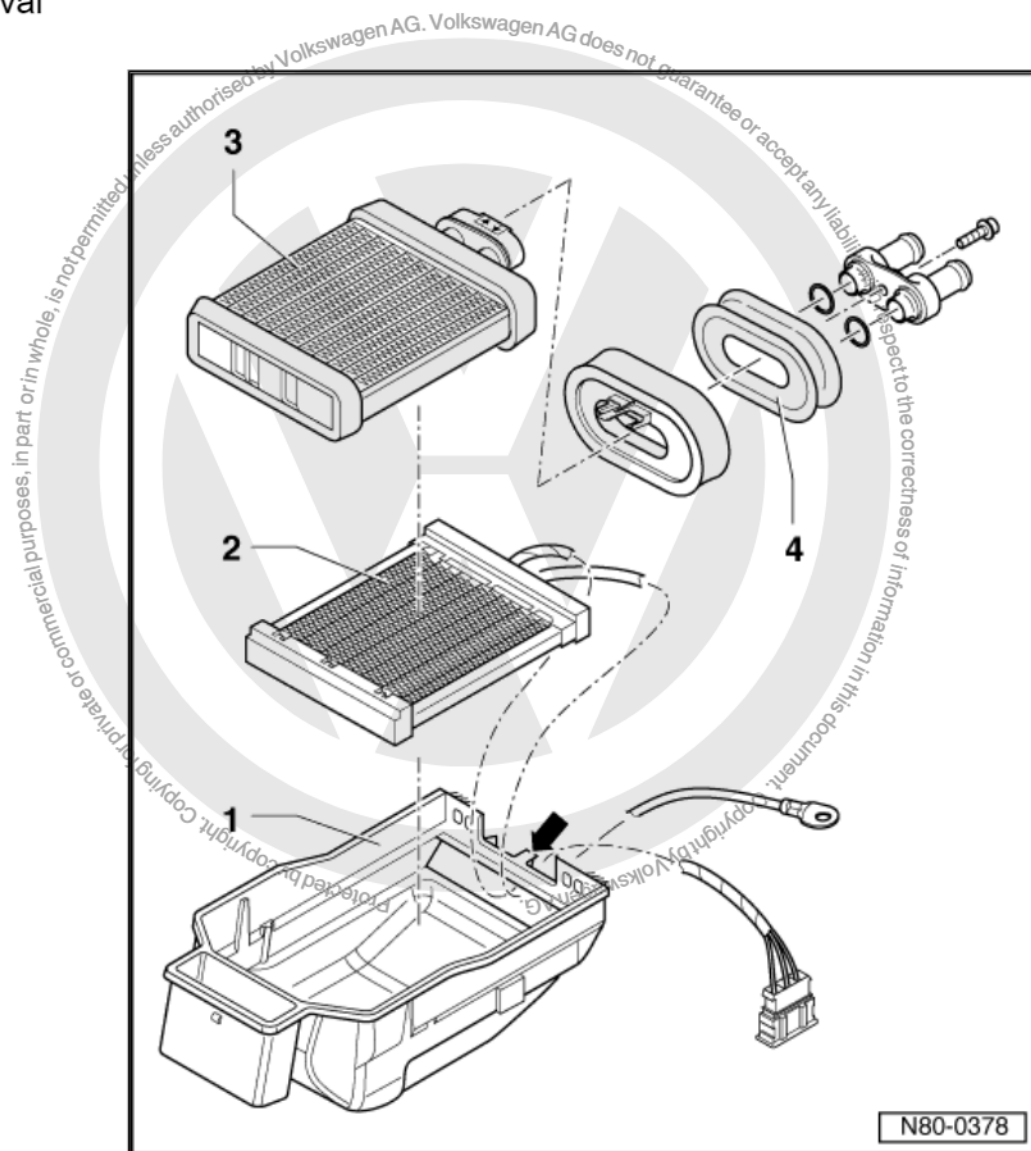
Install by inverting the removal sequence, paying attention to the following:

- Observe the installation position of the seal -4- and of the heat exchanger hoses ⇒ [page 3](#)



5.6 Auxiliary heating resistor -Z35- - remove and install

5.6.1 Removal



- ◆ Installed only on vehicles with diesel engine.
- Remove the heat exchanger -3- ➔ [page 36](#).
- Disconnect the connector.
- Remove the Auxiliary heating resistor -Z35- -2-.

5.6.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Observe the installation position of the seal -4- and of the heat exchanger hoses ➔ [page 3](#)



5.7 Auxiliary heating resistor -Z35- - check

Auxiliary heating resistor -Z35- with peripheric mechanism

A Auxiliary heating resistor -Z35- with peripheric mechanism (charge signal from alternator terminal DF), Low heat output relay -J359- , High heat output relay -J360- , Intake manifold temperature sender -G72- , Coolant temperature sender -G62-) may be read through self-diagnosis by engine control unit.

5.7.1 Auxiliary heating resistor -Z35- - check

Special tools and workshop equipment required

- ◆ Portable multimeter -EQ 7318- or Portable multimeter -VAG 1526C- or Multimeter -VAG 1715-
- ◆ Current circuit diagram
- ◆ Measurement auxiliary cable set -VAG 1594C-
- ◆ Digital potentiometer (included in VAG 1594C) -VAG 1630-
- ◆ Diagnosis, Measurement and Information System -VAS 5051A/52-

?Checking conditions

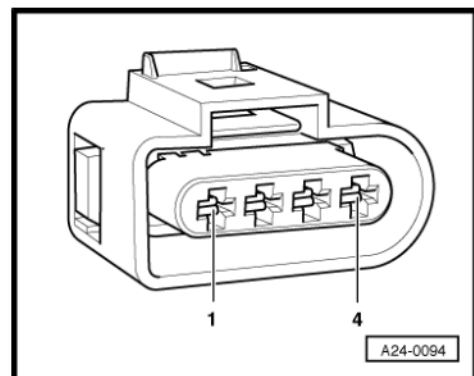
- Intake air temperature lower than 19 °C.
- Refrigerant temperature lower than 80 °C.
- Passenger room temperature 20 °C.
- Battery voltage higher than 11 V.
- Alternator load equal or lower than 50 % (terminal DF).
- Engine speed more than 450 rpm.
- Heater blower level 4.
- Interior temperature control knob in maximal heating position.

Test sequence

If the nominal values for intake and coolant temperature are not reached, perform the following checkings.

The intake air temperature sensor and intake manifold pressure sensor are located in the same housing in the intake manifold.

- Connect the Digital potentiometer (included in VAG 1594C) VAG 1630- in the connector for Intake manifold temperature sender -G72- between contacts -1- and -4-.



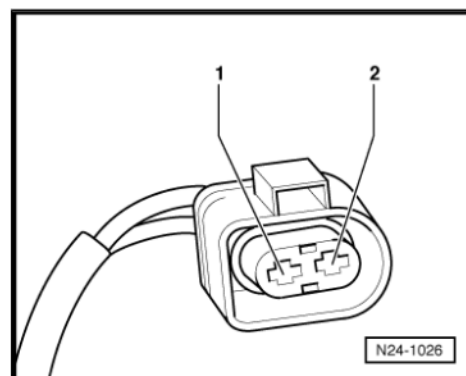
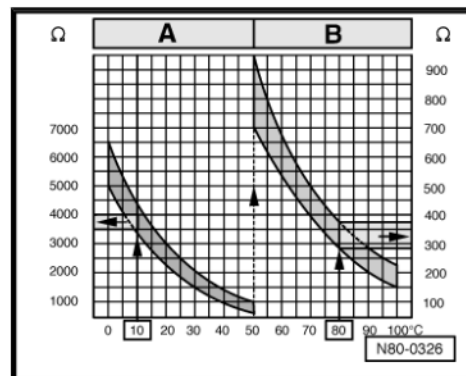


Refer to the diagram for nominal values.

position A -A- represents resistance values for temperature range 0...50 °C, position -B- represents values for temperature range 50...100 °C.

Reading example:

- ◆ 10 °C corresponds to a resistance of 3500...4000 Ohms.
- ◆ 80 °C corresponds to a resistance of 275...375 Ohms.
- Disconnect the connector of the Coolant temperature sender -G62- ⇒ Rep. Gr. 23 ; Mounting locations, unit with injection pump system .
- Connect the Digital potentiometer (included in VAG 1594C) - VAG 1630- to the connector of the Coolant temperature sender -G62- -G62- between contacts -1- and -2-.



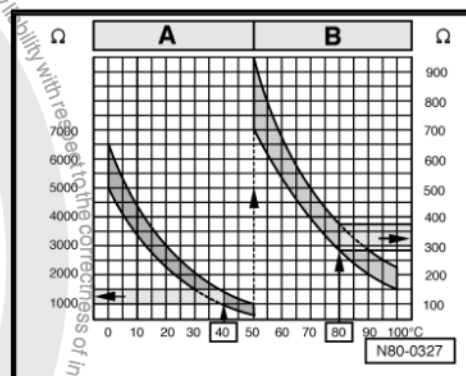
Refer to the diagram for nominal values.

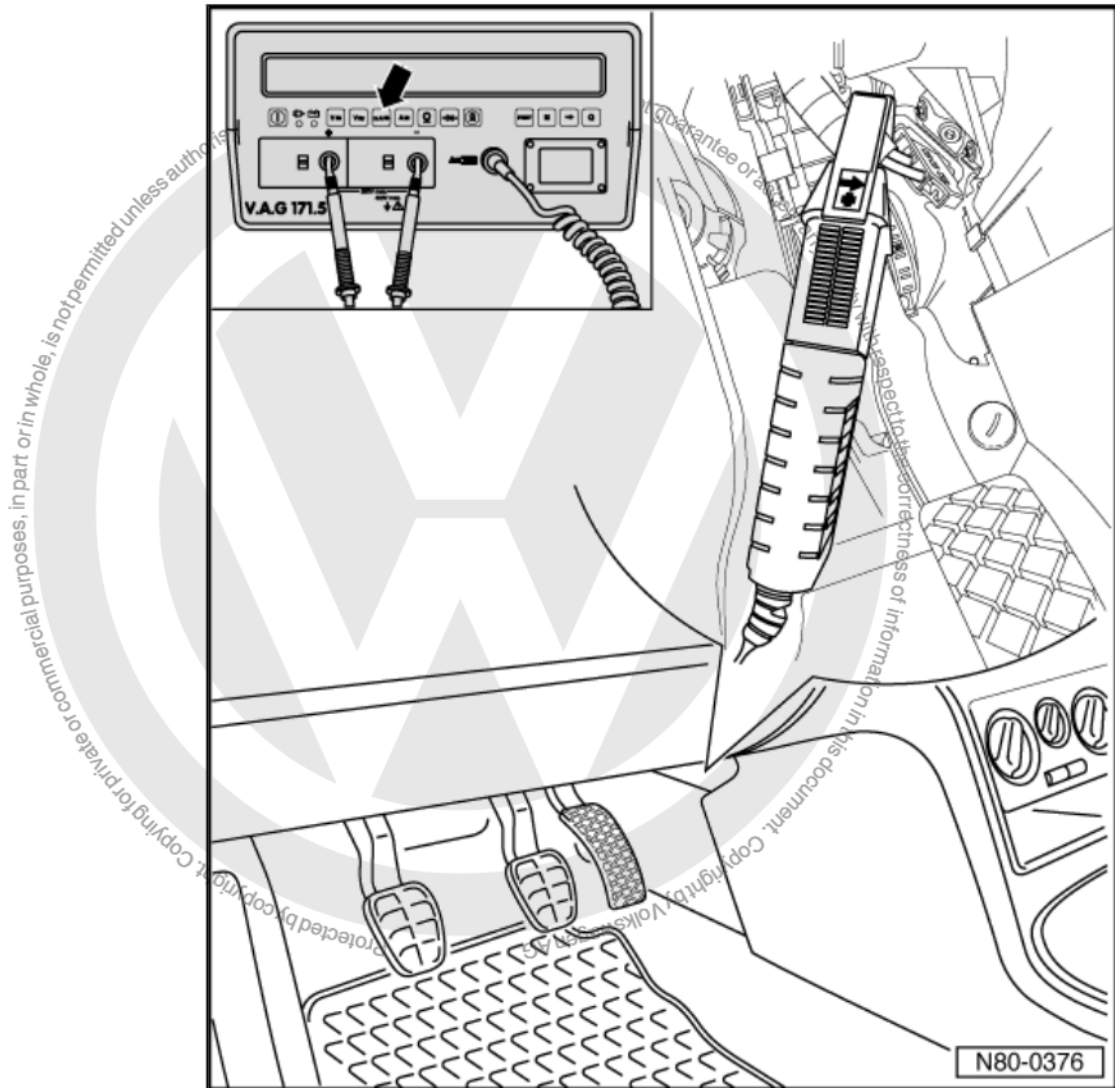
position A -A- represents resistance values for temperature range 0...50 °C, position -B- represents values for temperature range 50...100 °C.

Reading example:

- ◆ 40 °C corresponds to a resistance of 1000...1500 Ohms.
- ◆ 80 °C corresponds to a resistance of 275...375 Ohms.

Connect the Multimeter -VAG 1715- with the electric clamp to the thermal element supply cable of the Auxiliary heating resistor -Z35- .





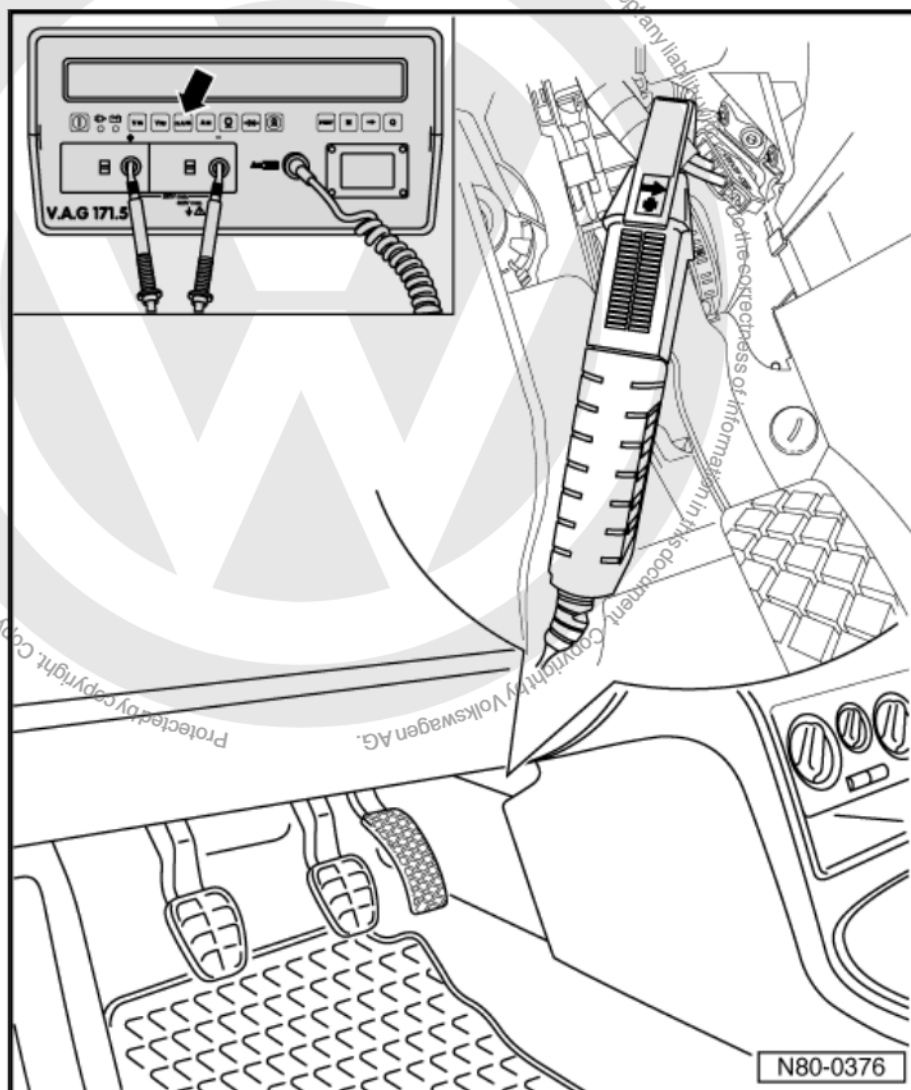
- Adjust the Multimeter -VAG 1715- for ampères readings.

After 10 seconds of engine start, the heating element for the Auxiliary heating resistor -Z35- is released by the Diesel direct injection system control unit -J248-. The three heating elements are switched on and off gradually through the engine control unit relay.

- Start the engine and let it idle.

Turn air conditioning off.

Under the determined check conditions, the starting current of the Auxiliary heating resistor -Z35- is approximately 38.9 A or greater. After a warming-up period of approximately 10 minutes of the Auxiliary heating resistor -Z35- current consumption will fall to 31.6 A. Should this value be lower than 10 A or more, cables should be examined in accordance with the circuit diagram ⇒ Current flow diagrams, Electrical fault finding and Fitting locations.



If no malfunction is detected in the wiring:

- Replace the Auxiliary heating resistor -Z35- ⇒ [page 37](#) .
- Erase fault memory ⇒ Vehicle diagnosis, testing and information system VAS 5051.



6 Plenum chamber (as from model-year 2011) - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.
- ◆ When the Battery -A-, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

6.1 Plenum chamber - general overview of assembly

1 - Sealing

- ☐ Replace if damaged

2 - Upper section of the plenum chamber

3 - Lower section of the plenum chamber

4 - Clip

- ☐ Replace if damaged

5 - Fresh air fan -V2-

- ☐ Remove and install
➔ [page 13](#)

6 - Fresh air fan pre-resistor with overheating fuse -N24-

- ☐ Remove and install
➔ [page 14](#)

7 - Dust and pollen filter cover

8 - Bushing

9 - Screw

- ☐ 1.5 Nm

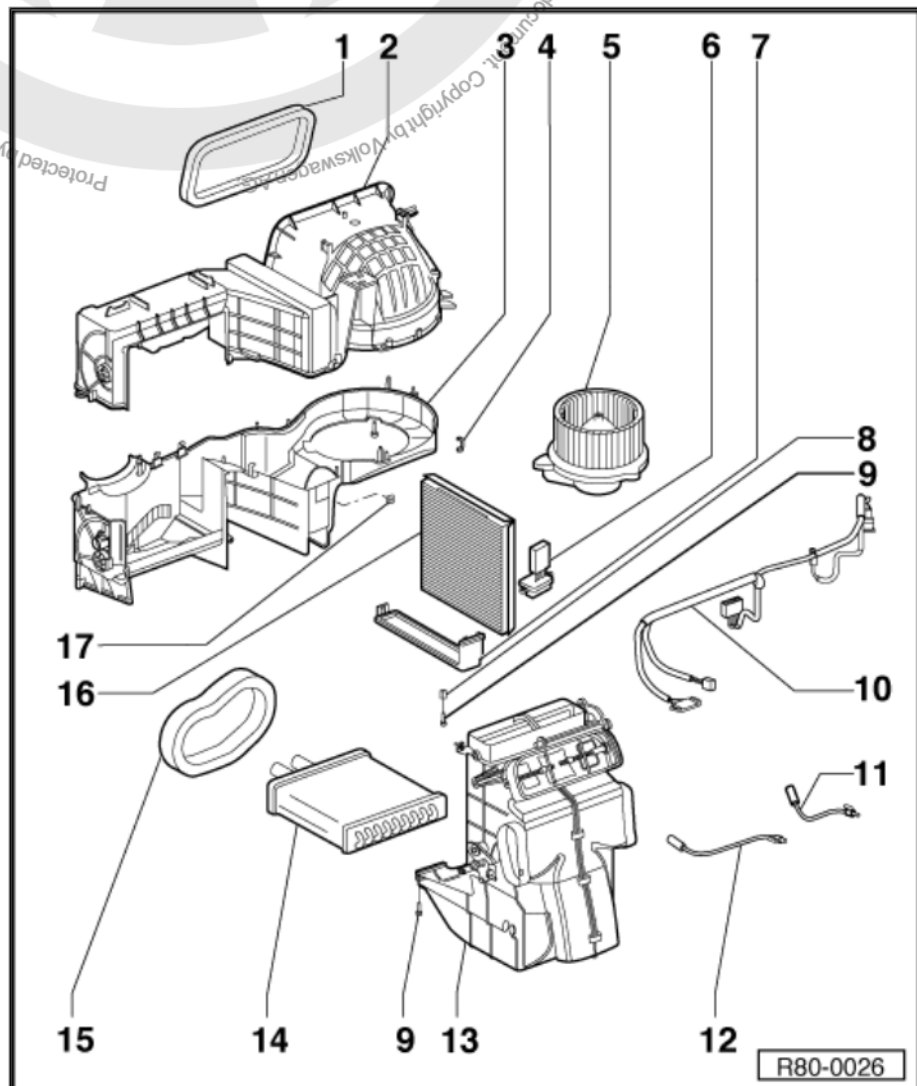
10 - Electrical conductors (harness)

11 - Air distribution command cable

- ☐ Remove and install
➔ [page 21](#)

12 - Temperature command cable

- ☐ Remove and install
➔ [page 21](#)





13 - Plenum chamber

- ☐ Remove and install ⇒ [page 25](#)

14 - Heat exchanger

- ☐ Remove and Install ⇒ [page 47](#)

15 - Heat exchanger sealing

- ☐ Replace if damaged

16 - Dust and pollen filter

- ☐ Remove and install ⇒ [page 14](#)

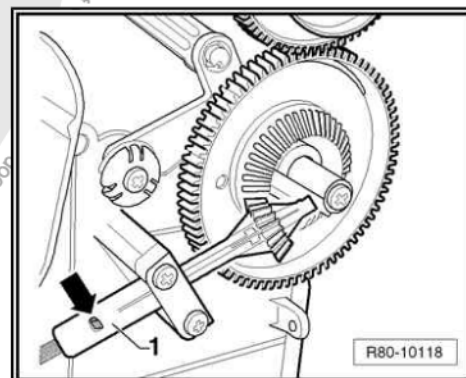
17 - Clip

- ☐ Replace if damaged

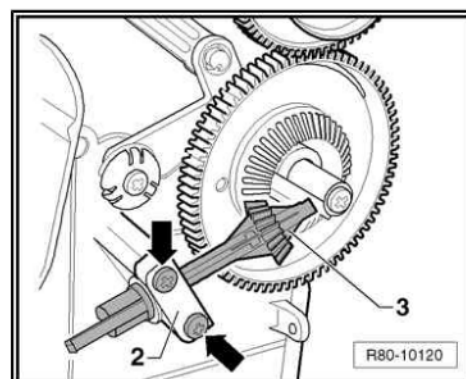
6.2 Air distribution operating mechanism - remove and install

6.2.1 Removal

- Remove plenum chamber ⇒ [page 25](#) .
- Disassemble the upper section of the plenum chamber.
- Press the lock -arrow- and remove the control cable -1- of the actuator mechanism.

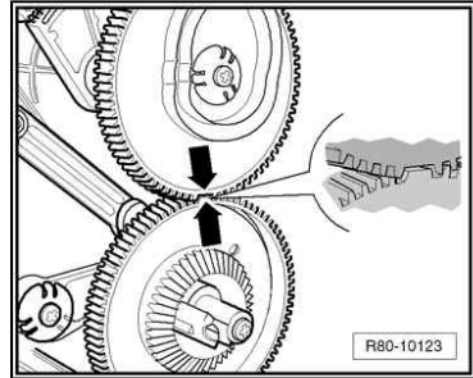


- Loosen the fastening screws -arrows-, unslot the bearing -2- and remove distribution lever -3-.

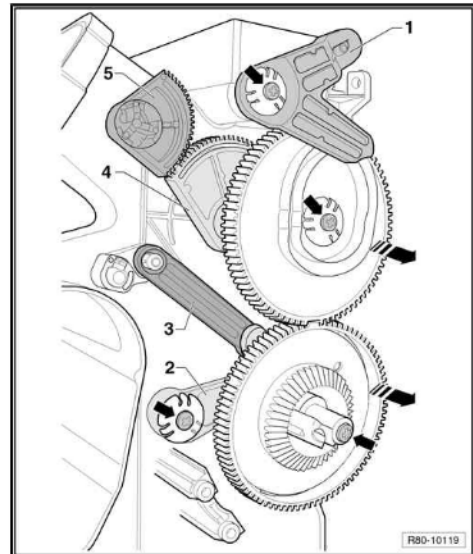




- Position the actuator mechanism gears to align the markings -arrows- align with each other.

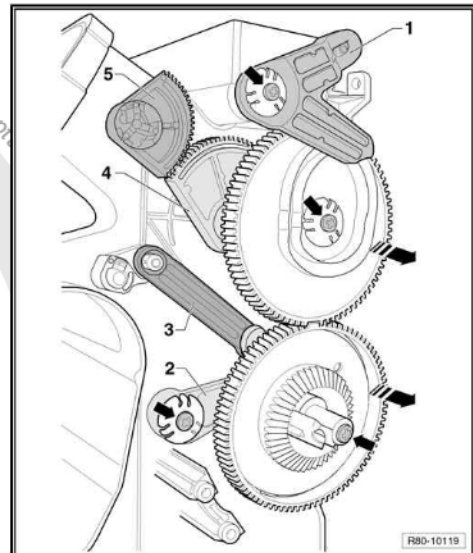


- Mark the positions of levers -1, 2, 3, 4 and 5- loosen the fastening screws -arrows-.
- Remove the gear and lever set in the direction of the -arrows-.



6.2.2 Installation

- Assemble and position the levers -2, 3, 4 and 5- in accordance with the corresponding marks.

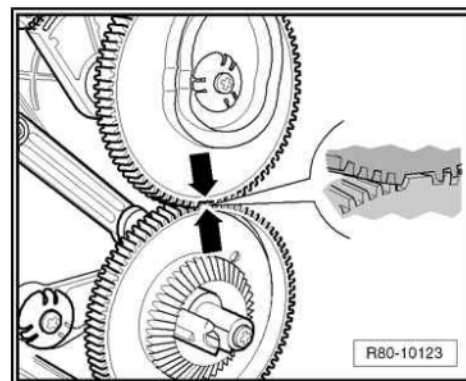




- Position the actuator mechanism gears to align the markings -arrows- align with each other.
- Assemble the upper lever.
- After installation, check the operation of the adjustment mechanism.

All flaps shall move freely and without bumps, otherwise, remove the mechanism and repeat the installation.

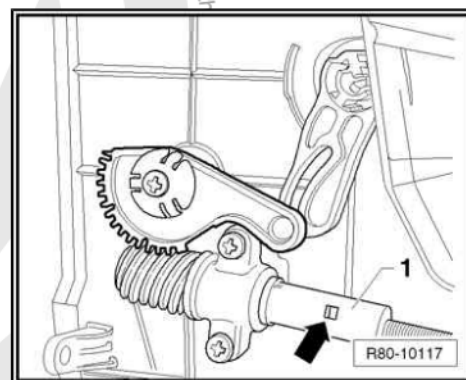
- Install the plenum chamber ⇒ [page 25](#) .



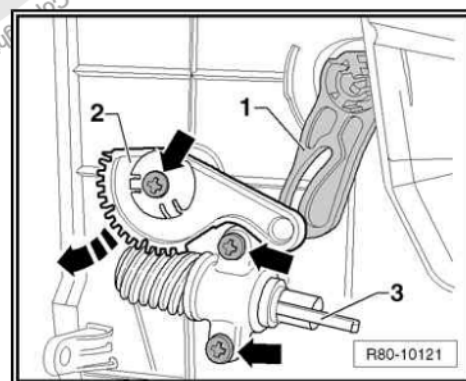
6.3 Temperature adjustment mechanism - remove and install

6.3.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .
- Remove the front left footwell air duct ⇒ [page 17](#) .
- Press the lock -arrow- , and pull out the command cable -1- for the temperature adjustment mechanism.



- Mark the position of the levers -1 and 2- with the temperature adjustment hatch in the fully closed position.
- Loosen the fastening screws -arrows- and remove the mechanisms -2- and -3- for temperature adjustment, in the direction of the arrow.



6.3.2 Installation

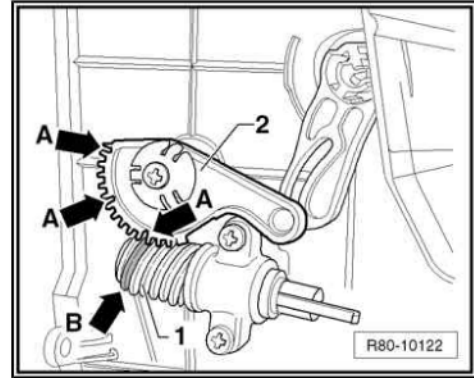
Install by inverting the removal sequence, paying attention to the following:



Note

- ◆ Before installing, check that the position of the worm screw -1- and gear segment -2- match up.
- ◆ The larger thread (dark hatched area) -arrow A- should fit into the deeper tooth intervals -arrow B-.
- Install the adjustment mechanism -1- and -2- with the small temperature adjustment hatch lever in the fully closed position.
- After installation, check the operation of the adjustment mechanism.

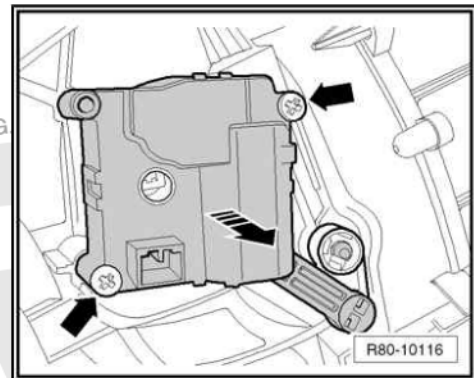
All flaps shall move freely and without bumps, otherwise, remove the mechanism and repeat the installation.



6.4 Control motor for the fresh air valve and the recirculation valve -V154- - remove and install

6.4.1 Removal

- Disconnect the connector of the Control motor for the fresh air valve and the recirculation valve -V154- .
- Loosen the fastening screws -arrows- and remove the Control motor for the fresh air valve and the recirculation valve -V154- towards the arrow.



6.4.2 Installation

Install by inverting the removal sequence, paying attention to the following:



Note

A new Control motor for the fresh air valve and the recirculation valve -V154- is supplied in the end position "air circulation operation".



7 Heat exchanger - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ⇒ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



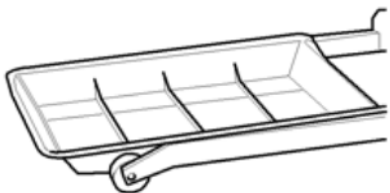
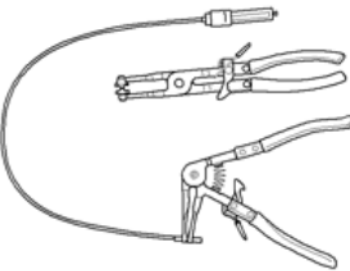
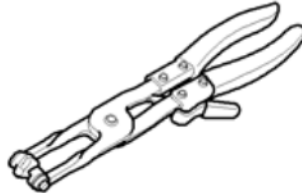


Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.
- ◆ When the Battery -A-, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

Special tools and workshop equipment required

- ◆ Torque wrench - 5 to 50 Nm (socket 1/2") -VAG 1331-
- ◆ Clamps (diam. 25 mm) -3094-
- ◆ Drip tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 or VAS 5024A-
- ◆ Standard-type clamp pliers -VW 5163-

<p>VAG 1331</p> 	<p>3094</p> 
<p>VAG 1306</p> 	<p>VAS 5024A</p> 
<p>VW 5163</p> 	<p>Q87-10005</p>



7.1 Heat exchanger - remove and install



WARNING

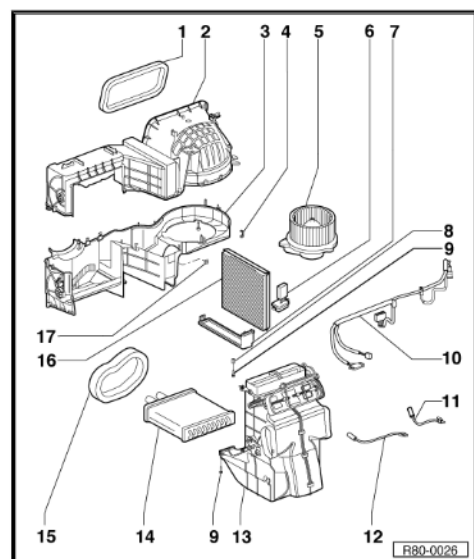
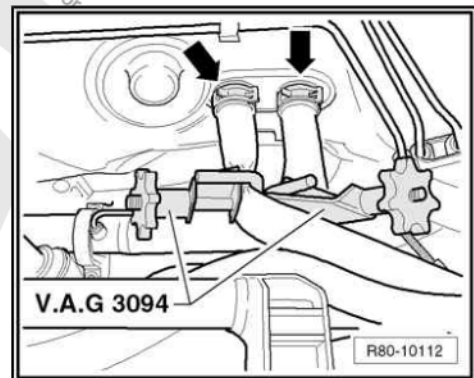
Risk of burns!

When the engine is hot, the refrigerant temperature might be higher than 100 °C. The cooling system is under pressure.

Before starting any work, reduce pressure and temperature, if necessary.

7.1.1 Removal

- Close the coolant hoses in engine compartment with Clamps (diam. 25 mm) -3094- .
- Release the clamps -arrows- with Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a compressed air hose on one of the heat exchanger outlets. Place a container to collect coolant on the other outlet.
- With a compressed air gun, remove coolant from the heat exchanger.
- Remove the expansion valve, if any ➔ [page 105](#) .
- Remove the radio from the instrument panel ➔ Communication; Rep. Gr. 91 ; Radio, telephone, navigation system .
- Remove the Combined instrument -K- ➔ Electrical system; Rep. Gr. 90 ; Instrument case, indicators .
- Remove the instrument panel ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the right support of the dash bracket ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the remaining fastening screws.
- Separate plenum chamber from the dash support and release harnesses and connectors fastened to plenum chamber.
- Remove the plenum chamber from its housing .
- Disassemble the upper and lower sections of the plenum chamber -2- and -3-.
- Pull out the heat exchanger -14- from the plenum chamber -13-.





7.1.2 Installation

Install by inverting the removal sequence, paying attention to the following:



WARNING

Observe the correct assembly position of the heat exchanger with respect to the lower section of the plenum chamber.

Assembly position for the heat exchanger:

- Position the heat exchanger in the lower part of the plenum chamber in a way that the quotes -A- and -nd- (greater) "ALIGN". following the same reference for quotes -B- and -b- (smaller).



Note

The heat exchanger must be assembled correctly to prevent water infiltration into the vehicle.

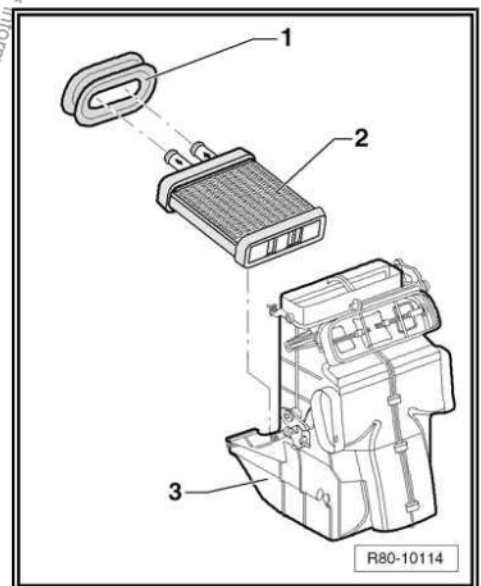
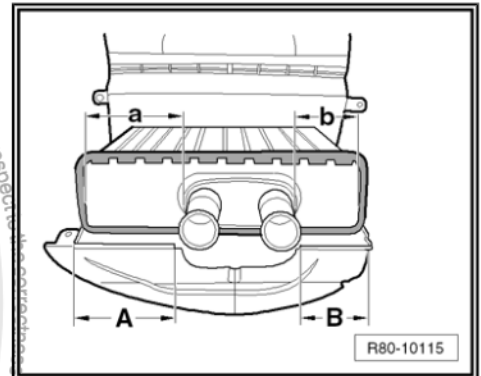
- Observe the installation position of the seal -1- and of the hoses on the heat exchanger -2- ➔ [page 12](#) .



Note

After removal or replacement of heat exchanger, the cooling system will contain air; to remove the air, proceed as follows:

- Start the engine and keep it revved at 2500 rpm until coolant level in the tank lowers after the thermostat valve opens (the air that was in the heat exchanger is moved to the coolant tank, causing the coolant level there to decrease).
- Top up coolant tank ➔ Engine; Rep. Gr. 19 ; Cooling system .





87 – Air conditioning

1 Instructions on repair work on vehicles with air conditioning system and how to handle the cooling gas

Additional information and safety measures related to R134a cooling gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

Other information:

- ◆ The update current circuit diagrams are found by selecting the Wiring diagrams icon.
- ◆ Repairs to the cooling gas loop must only be executed at authorized and specialized technical assistance workshops.
- ◆ A warning sign on the engine compartment lock support provides information about the cooling gas used and the filling capacity.



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the battery earth strap.*
- ◆ *When the battery is reconnected, check the operation of the vehicle electrical system (radio, clock and electric door and window locks, etc.) according to the Workshop Manual and/or instructions for use.*



2 Service valves - location

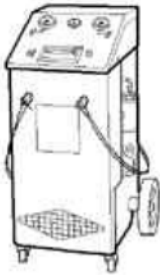




Note

- ◆ The service valves are located in the engine compartment, on the right side of the vehicle, near the front panel.
- ◆ Other equipment and testing tools may also be used, see ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

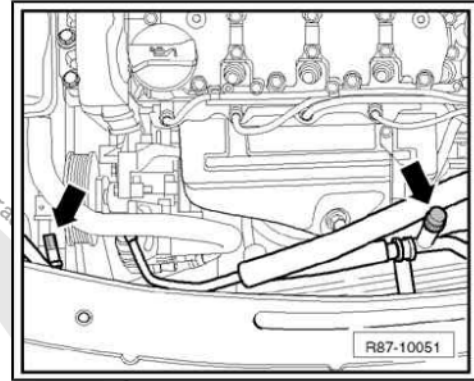
Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7105-

<p>EQ 7098</p> 	<p>EQ 7104</p> 
<p>EQ 7105</p> 	
	<p>Q87-10002</p>



- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ;
Technical data .





3 Air conditioning (up to model-year 2010)

3.1 Heating and air conditioning - cabin components

1 - Side air vents with frame

- ☐ Remove and install
⇒ [page 6](#)
- ☐ With built-in air vents for side windows

2 - Demisting baffle

- ☐ Remove only after the dashboard has been removed

3 - Centre vent baffle

- ☐ Remove and install
⇒ [page 7](#)

4 - Ventilation adjustment mechanism

- ☐ Remove and install
⇒ [page 9](#)

5 - Demister nozzle

- ☐ Remove and install
⇒ [page 8](#)

6 - Air duct

- ☐ For the right air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

7 - Air duct

- ☐ For the left air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

8 - Air distributor for baffles

- ☐ Remove and install
⇒ [page 8](#)

9 - Control motor for the fresh air valve and the recirculation valve -V154-

10 - Fresh air fan -V2-

- ☐ Remove and install ⇒ [page 3](#)

11 - Front right footwell air duct

- ☐ Remove and install ⇒ [page 7](#)

12 - Lower central frame

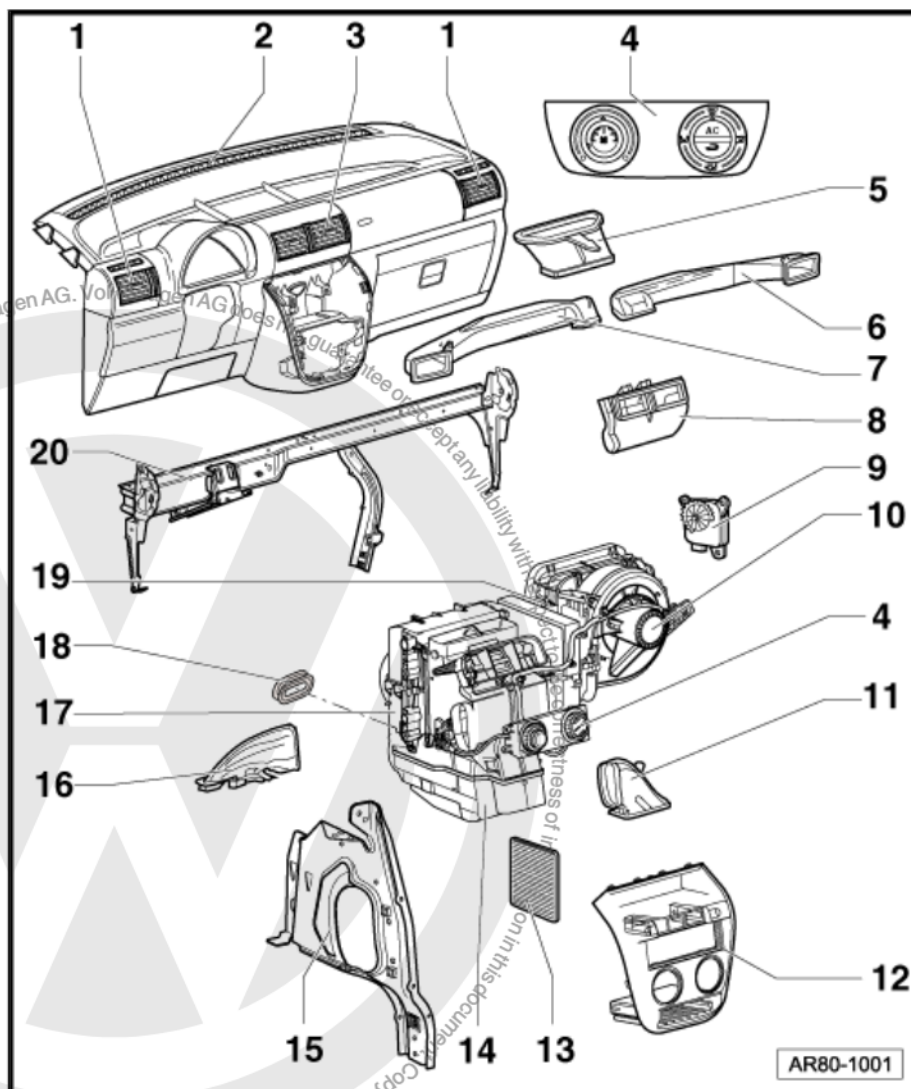
- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

13 - Dust and pollen filter

- ☐ Remove and install ⇒ [page 5](#)

14 - Heat exchanger

- ☐ Remove and install ⇒ [page 36](#)





15 - Left mounting of transverse support

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install

16 - Front left footwell air duct

- ☐ Remove and install ⇒ [page 7](#)

17 - Plenum chamber

- ☐ Remove and install ⇒ [page 55](#)
- ☐ Disassemble and assemble ⇒ [page 31](#)

18 - Heat exchanger/engine compartment partition panel sealing

- ☐ Observe the installation position ⇒ [page 3](#)
- ☐ Replace if damaged

19 - Fresh air fan pre-resistor with overheat fuse -N24-

- ☐ Remove and install ⇒ [page 4](#)

20 - Transverse support

- ☐ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install





4 Plenum chamber (up to model-year 2010) - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.

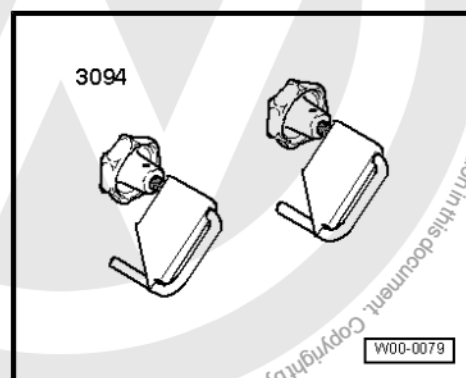


Note

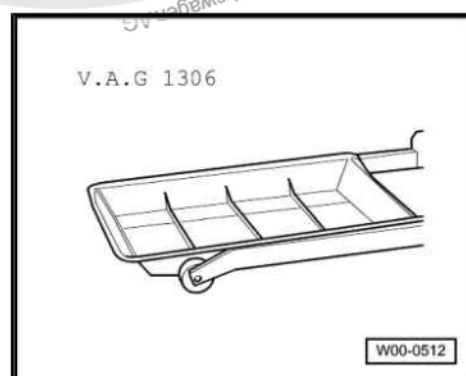
- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the battery earth strap.*
- ◆ *When the battery is reconnected, check the operation of the vehicle electrical system (radio, clock and electric door and window locks, etc.) according to the Workshop Manual and/or instructions for use.*

Special tools and workshop equipment required

- ◆ Clamps (diam. 25 mm) -3094-

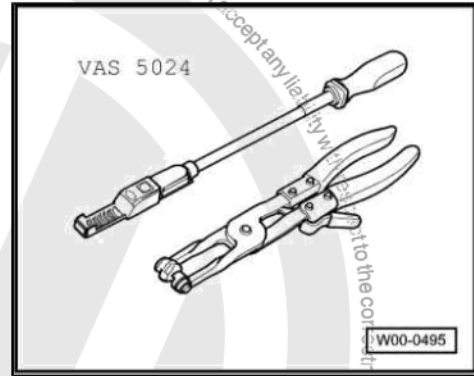


- ◆ Drip tray -VAG 1306-

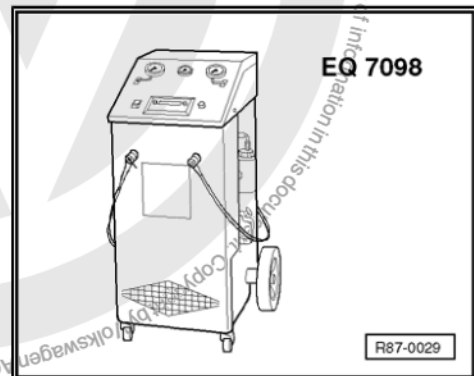




- ◆ Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A-



- ◆ Assembly for climatizer recovery, recycling and recharge or EQ 7098 -VAS 6008-





- 1 - Dust and pollen filter
 - ☐ Remove and install
⇒ [page 5](#)
- 2 - Hexagon combination screw
 - ☐ 2 units
 - ☐ 12 Nm
- 3 - Air distribution command cable
 - ☐ Remove and install
⇒ [page 10](#)
- 4 - Temperature command cable
 - ☐ Remove and install
⇒ [page 10](#)
- 5 - Heat exchanger
 - ☐ Remove and install
⇒ [page 36](#)
- 6 - Left mounting of transverse support
 - ☐ Remove and install ⇒
Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install
- 7 - Hexagon combination screw
 - ☐ 2 units
 - ☐ 12 Nm
- 8 - Hexagon combination screw
 - ☐ 2 units
 - ☐ 12 Nm
- 9 - Torx screw T 20
 - ☐ 3 units
 - ☐ 5 Nm
- 10 - Heat exchanger/engine compartment partition panel sealing
 - ☐ Observe the installation position ⇒ [page 3](#)
 - ☐ Replace if damaged
- 11 - Evaporator

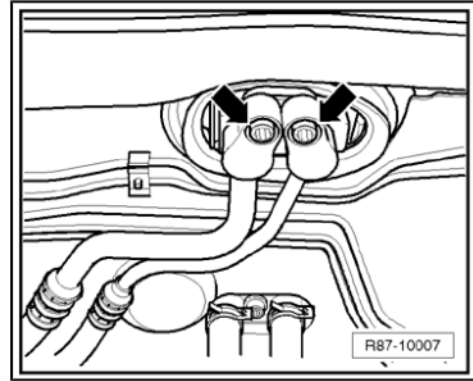


4.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install .
- Connect the Assembly for climatizer recovery, recycling and recharge or EQ 7098 -VAS 6008- to the service valves -arrows- of the cooling gas loop and suck out all the gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; The use of the Assembly for climatizer recovery, recycling and recharge or EQ 7098 -VAS 6008- .



- Loosen the screws and remove the piping of cooling gas circuit.



- Close the coolant hoses in engine compartment with Clamps (diam. 25 mm) -3094- .

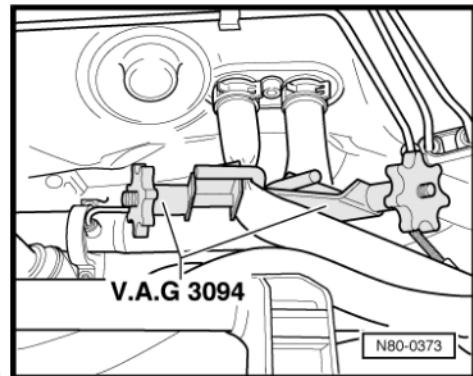


WARNING

Risk of burns!

When the engine is hot, the refrigerant temperature might be higher than 100 °C. The cooling system is under pressure.

Before starting any work, reduce pressure and temperature, if necessary.



- Loosen the clamps with Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. Place a container to collect coolant on the other outlet.
- Remove the refrigerant from the heat exchanger with a compressed air gun.
- Remove the right support of the panel bracket.
- Remove the remaining fastening screws.
- Remove the air intake case of the panel bracket and disconnect harnesses and connectors from the air intake case.
- Remove the plenum chamber.

4.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Reassemble the harnesses and all the connectors in their original positions.
- Check the refrigerant level and refill, if necessary.

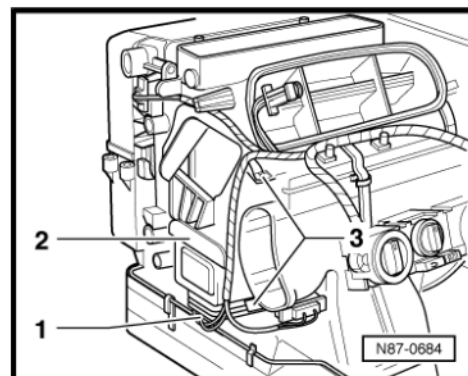
4.3 Temperature adjustment valve control motor function -V68- - remove and install

4.3.1 Removal

- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Instrument panel - remove and install
- Remove the front left footwell air duct ⇒ [page 7](#) .
- Remove the left support of the transverse bracket of the panel.



- Pull off connector -1-.
- Press the locks -3- lightly forward.
- Loosen and remove the Temperature adjustment valve control motor function -V68- -2- together with the support.



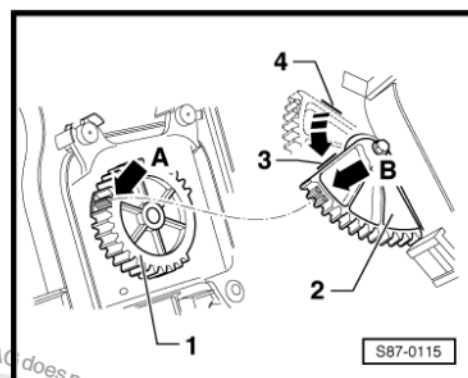
4.3.2 Installation



Note

A new Temperature adjustment valve control motor function -V68- is supplied in the position "of temperature flap closed".

- Mark the upper and lower limits -4- and -3- in the plenum chamber.
- Adjust the gear segment -2- to the lower limit -3-.
- Mark the tooth side ("short") -A- on the Temperature adjustment valve control motor function -V68- -1-.
- Mark the sides of the "shorter teeth" -B- of the tooth segment -2-.
- Press the support with the Temperature adjustment valve control motor function -V68- in the chamber to fit the tooth -A- in the gap -B-.
- Connect the connector.
- Switch on the ignition and check Temperature adjustment valve control motor function -V68- by turning the temperature adjuster.



Note

- ◆ *The temperature flap shall move freely and without bumps on its final positions.*
- ◆ *Immediately turn off the ignition in case of malfunction and repeat the installation.*
- Check function with the Diagnosis, Measurement and Information System -VAS 5051A/52- → [page 59](#).

4.4 Temperature adjustment valve control motor function -V68- - check

- Connect the Diagnosis, Measurement and Information System -VAS 5051A/52-.
- Select, on Diagnosis, Measurement and Information System -VAS 5051A/52- function Assisted Fault Pinpointing.
- Select the corresponding version, vehicle, model, year and engine and press Advance.

After consulting all command units, select the following functions:



- ◆ [Advance](#)
- ◆ [Go to](#)
- ◆ [Selection of Functions/Components](#)
- ◆ [Body](#)
- ◆ [Heating, Ventilation and Air Conditioning](#)
- ◆ [Electrical components](#)
- Continue selecting the functions you want in Diagnosis, Measurement and Information System -VAS 5051A/52- ⇒ Vehicle diagnosis, testing and information system VAS 5051.





5 Air conditioning (as from model-year 2011)

5.1 Heating and air conditioning - cabin components



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.*
- ◆ *When the Battery -A- , check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.*





1 - Demisting baffle

- ❑ Remove only after the instrument panel has been removed ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

2 - Side air baffles

- ❑ Remove and install ⇒ [page 15](#)

3 - Demister nozzle

- ❑ Remove and install ⇒ [page 17](#)

4 - Right air duct

- ❑ For the right air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

5 - Left air duct

- ❑ For the left air baffle on the dash ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

6 - Air distributor for baffles

- ❑ Remove and install ⇒ [page 17](#)

7 - Front left air duct in the footwell

- ❑ Remove and install ⇒ [page 17](#)

8 - Middle air duct

- ❑ Remove and install ⇒ [page 17](#)

9 - Front right air duct for the footwell

- ❑ Remove and install ⇒ [page 17](#)

10 - Lower central frame

- ❑ With integrated central air baffles.
- ❑ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

11 - Ventilation adjustment mechanism

- ❑ Remove and install ⇒ [page 19](#)

12 - Sealing

- ❑ Observe the installation position ⇒ [page 63](#)
- ❑ Replace if damaged

13 - Heat exchanger

- ❑ Remove and install ⇒ [page 47](#)

14 - Control motor for the fresh air valve and the recirculation valve -V154-

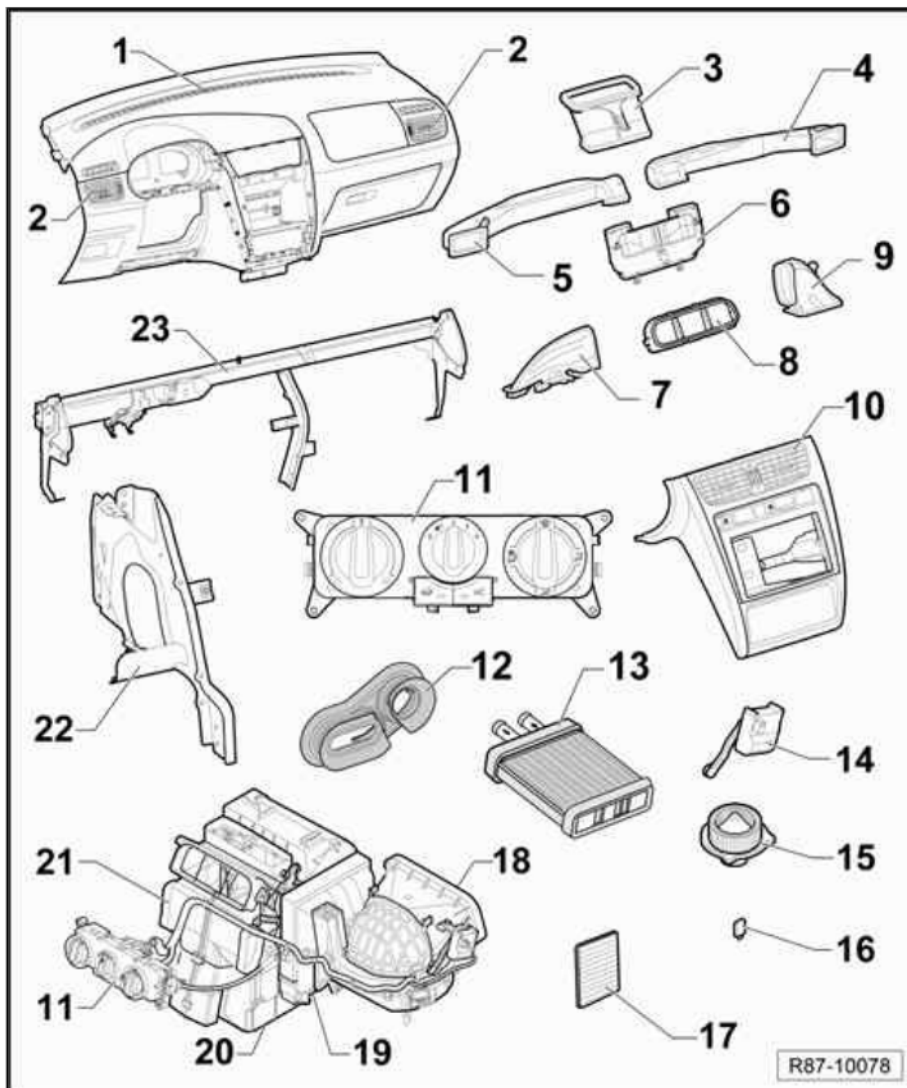
- ❑ Remove and install ⇒ [page 46](#)

15 - Fresh air fan -V2-

- ❑ Remove and install ⇒ [page 13](#)

16 - Fresh air fan pre-resistor with overheating fuse -N24-

- ❑ Remove and install ⇒ [page 14](#)



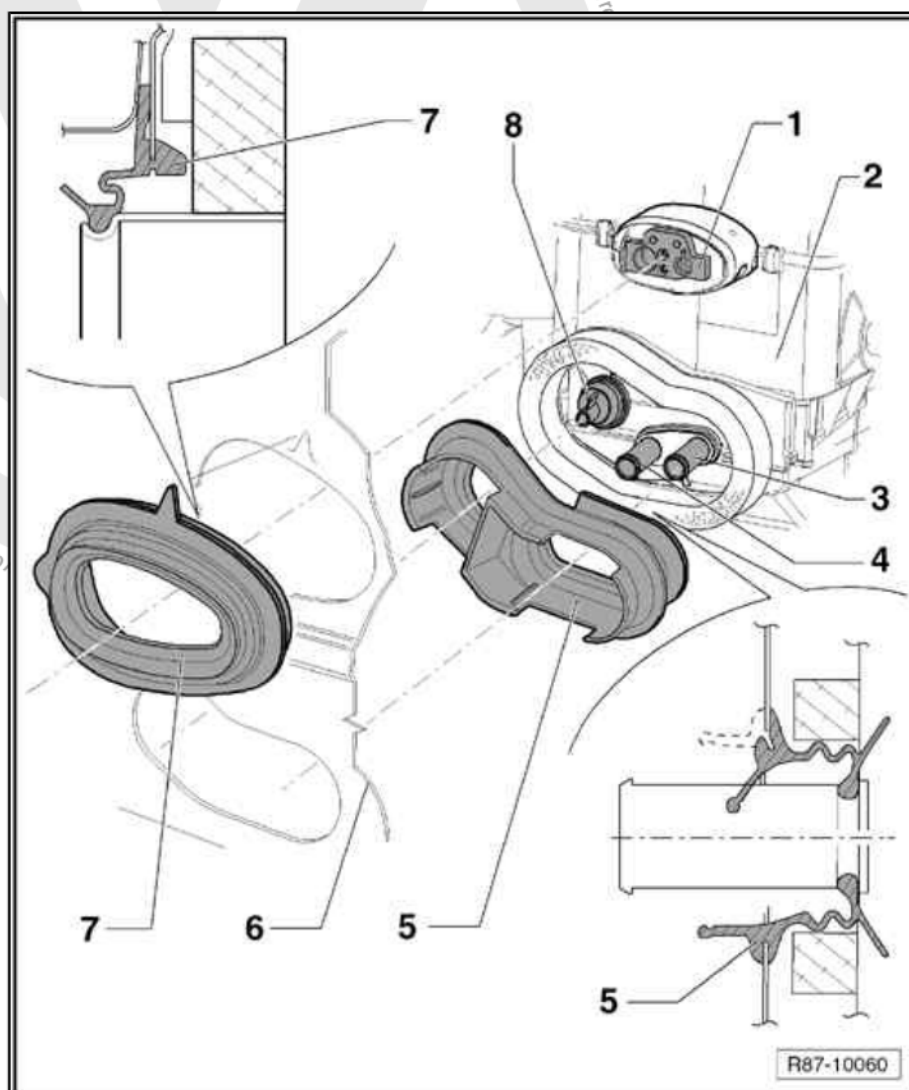


- 17 - Dust and pollen filter
 - ☐ Remove and install ➔ [page 14](#)
- 18 - Air intake duct housing
- 19 - Dust and pollen filter compartment
- 20 - Heat exchanger compartment
- 21 - Plenum chamber
 - ☐ Remove and install ➔ [page 64](#)
- 22 - Left mounting of transverse support
 - ☐ Remove and install ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation
- 23 - Transverse support
 - ☐ Remove and install ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

5.2 Seals of the engine compartment partition panel

- ◆ Vehicles with ventilation / heating system ➔ [page 12](#) .

- 1 - Expansion valve
 - ☐ Remove and install ➔ [page 105](#)
- 2 - Plenum chamber (air conditioning)
 - ☐ Remove and install ➔ [page 64](#)
- 3 - Heat exchanger intake duct
 - ☐ Heat exchanger - remove and install ➔ [page 47](#)
- 4 - Heat exchanger outlet duct
 - ☐ Heat exchanger - remove and install ➔ [page 47](#)
- 5 - Heat exchanger sealing
 - ☐ Replace if damaged
- 6 - Engine compartment partition panel
- 7 - Sealing of expansion valve
 - ☐ Replace if damaged
- 8 - Evaporator drainage duct
 - ☐ The water output valve must not be blocked or obstructed
 - ☐ Check the correct installation position of the seal for the water output valve in the partition panel





6 Plenum chamber (as from model-year 2011) - remove and install



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.

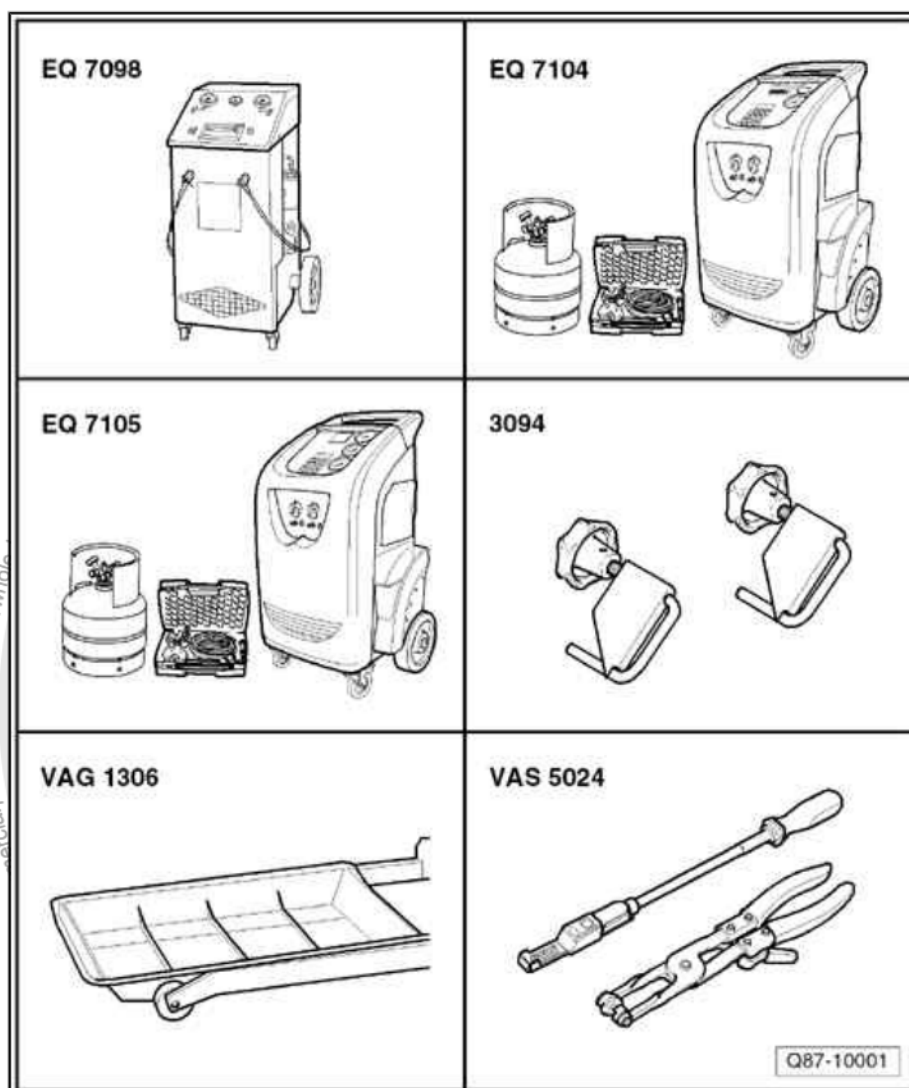


Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.
- ◆ When the Battery -A- is checked, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

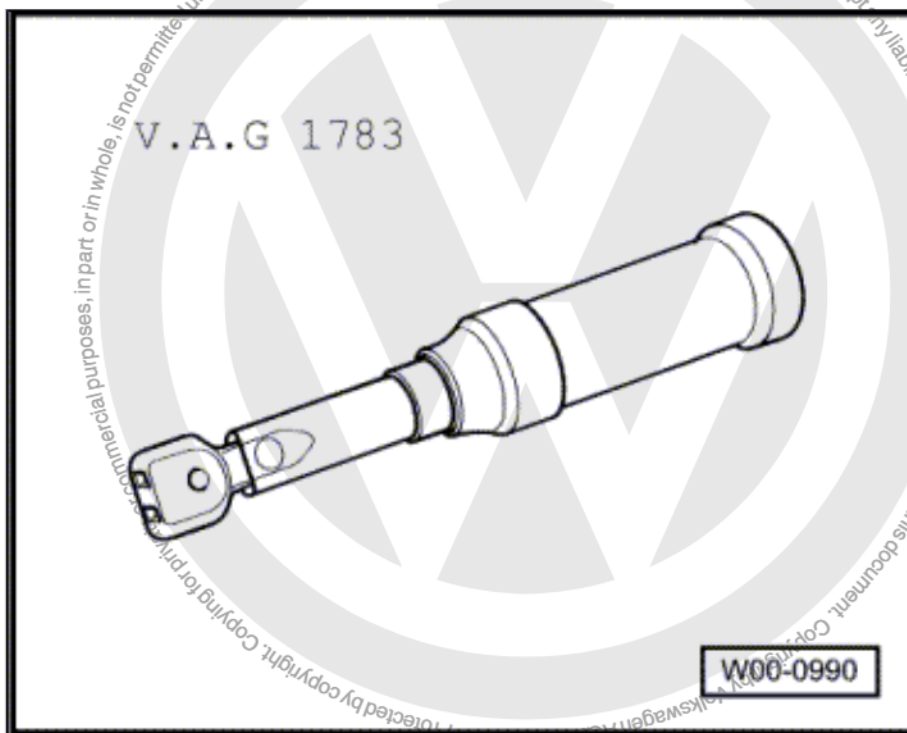
Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7105-
- ◆ Clamps (diam. 25 mm) -3094-
- ◆ Drip tray -VAG 1306-
- ◆ Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A-

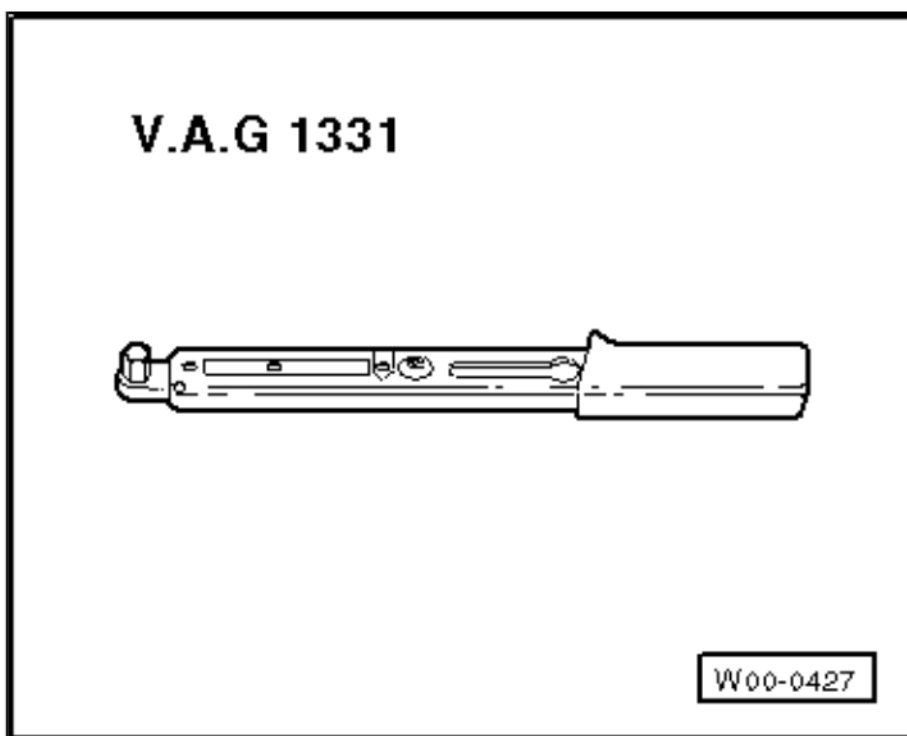




- ◆ Torque wrench 2 to 10 Nm
-VAG 1783-



- ◆ Torque wrench - 5 to 50 Nm
(socket 1/2") -VAG 1331-





6.1 Plenum chamber - remove and install

General overview of assembly :

1 - Transverse support

- ❑ Remove and install ⇒
Body - internal mount-
ings; Rep. Gr. 70 ; Lin-
ing / Insulation .

2 - Heat exchanger sealing

- ❑ Observe the installation
position ⇒ [page 63](#)
- ❑ Replace if damaged

3 - Sealing of expansion valve

- ❑ Observe the installation
position ⇒ [page 63](#)
- ❑ Replace if damaged

4 - Screw

- ❑ 2 units
- ❑ 12 ± 1.2 Nm

5 - Dust and pollen filter com- partment

- ❑ Dust and pollen filter -
remove and install
⇒ [page 14](#)

6 - Heat exchanger compart- ment

- ❑ Heat exchanger - re-
move and install
⇒ [page 47](#)

7 - Air distribution command cable

- ❑ Remove and install
⇒ [page 21](#)

8 - Left mounting of transverse support

- ❑ Remove and install ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation

9 - Screw

- ❑ 4 units
- ❑ 12 ± 1.2 Nm

10 - Screw

- ❑ 2 units
- ❑ 12 Nm

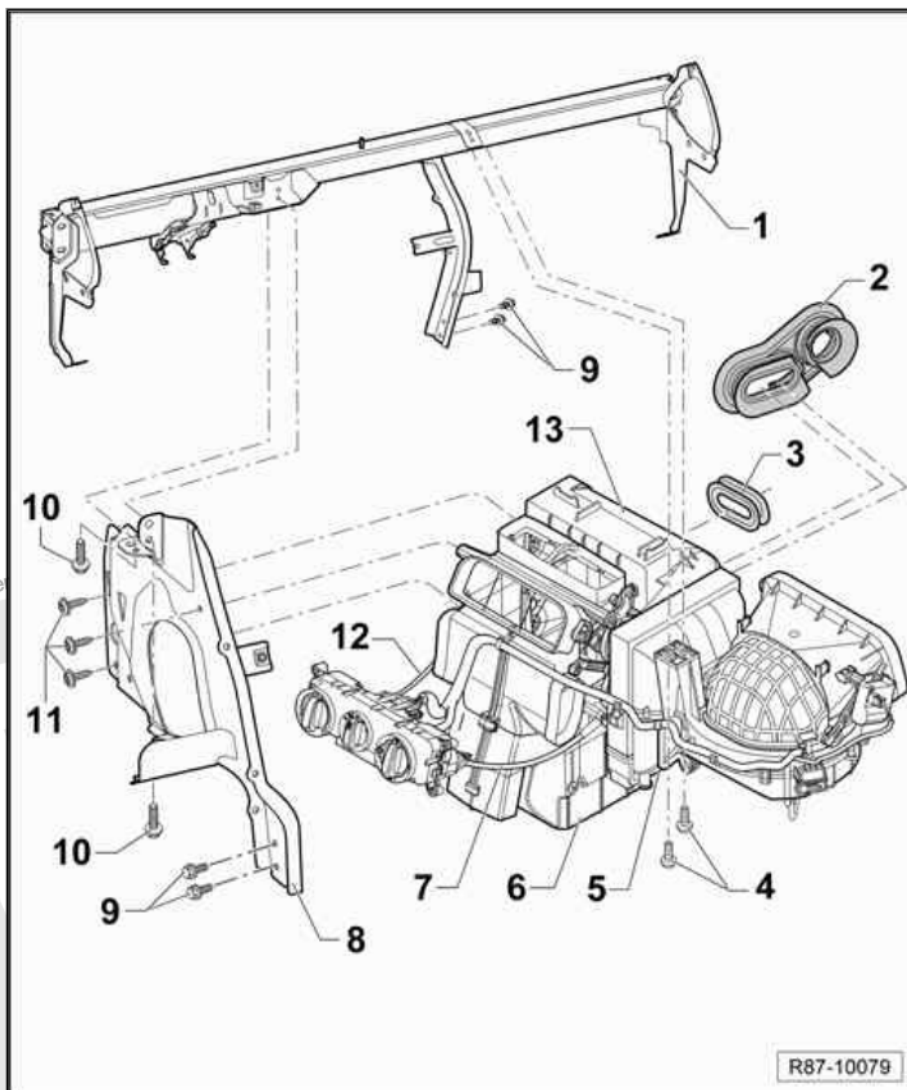
11 - Screw

- ❑ 3 units
- ❑ 5 ± 0.5 Nm

12 - Temperature command cable

- ❑ Remove and install ⇒ [page 21](#)

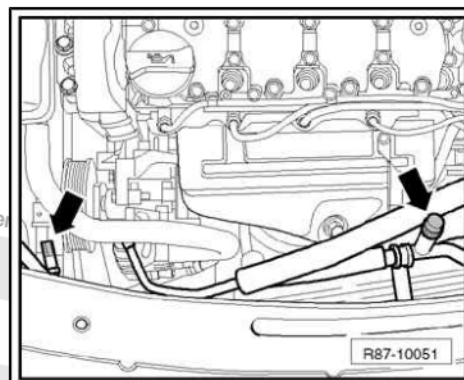
13 - Evaporator compartment





6.1.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .



- Loosen the fastening screws -arrows- and remove cooling gas loop lines.

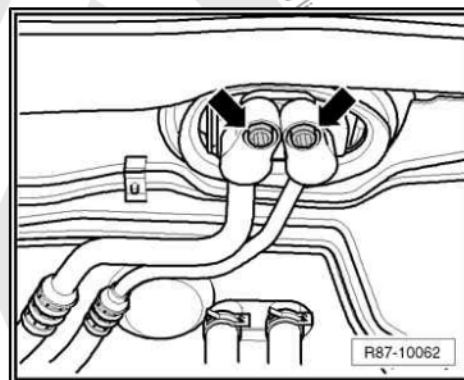


WARNING

Risk of burns!

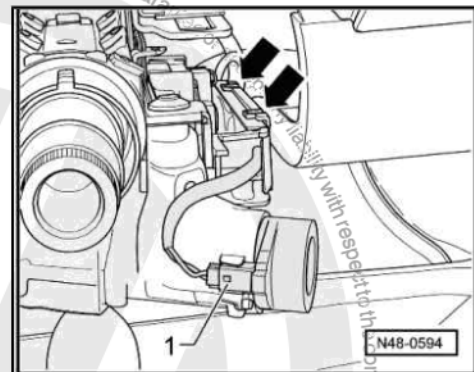
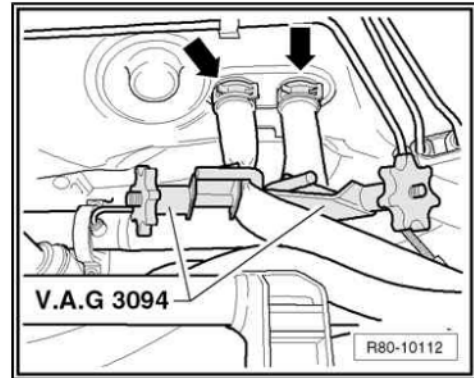
When the engine is hot, the refrigerant temperature might be higher than 100 °C. The cooling system is under pressure.

Before starting any work, reduce pressure and temperature, if necessary.



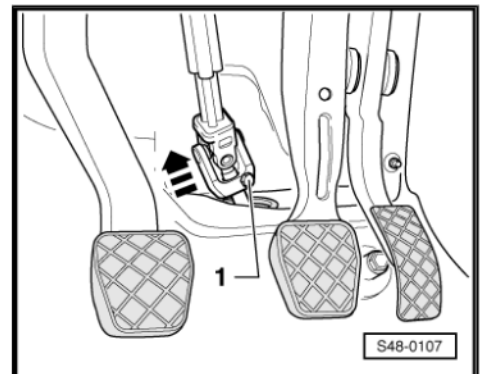
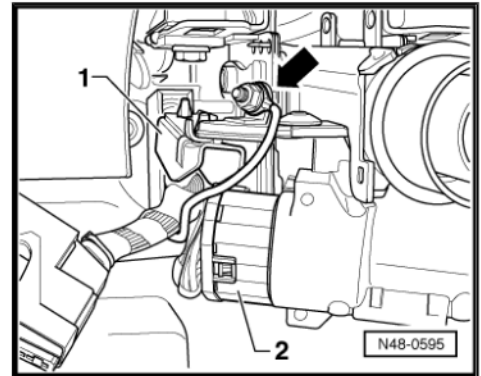


- Close the coolant hoses in engine compartment with Clamps (diam. 25 mm) -3094- .
- Release the clamps -arrows- with Standard-type clamp pliers -VW 5162 (VWB) - or - VAS 5024A- and remove the hoses.
- Install a hose on one of the heat exchanger outlets. Place a container to collect coolant on the other outlet.
- With a compressed air gun, remove coolant from the heat exchanger.
- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ➔ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .
- Remove the Combined instrument -K- ➔ Electrical equipment; Rep. Gr. 90 ; Instrument case, indicators .
- Remove the Radio -R- or "CD player" -R89- from the instrument panel ➔ Communication; Rep. Gr. 91 ; Radio equipment .
- Remove instrument panel switches ➔ Electrical equipment; Rep. Gr. 96 ; Switches, lights and internal bulbs, alarm .
- Remove the central frame of the instrument panel ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the ventilation adjustment mechanism ➔ [page 19](#) .
- Pull off steering wheel ➔ Running gear, ??axles, ??steering; Rep. Gr. 48 ; Steering .
- Remove the steering column coverings ➔ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the turn signal and wiper/washer switches ➔ Electrical equipment; Rep. Gr. 94 ; Switches, lights and external lamps .
- Pull off connector -1- from the Immobilizer reading coil -D2- .
- Open the cable support (right side) in the tabs -arrows- and remove the wire.
- Disconnect the earth strap from the steering column -arrow-.

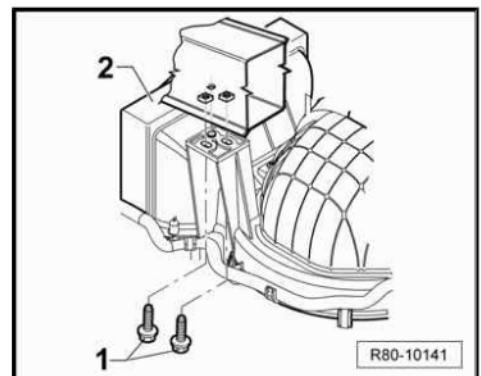




- Remove the earth strap and the support (left side) -1- from the switchbox cables.
- Disconnect the Ignition switch -D- -2- from the steering lock assembly.
- Remove the instrument panel ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove demister nozzle and air distributor to the central baffles ⇒ [page 17](#) .
- Remove front left footwell air duct ⇒ [page 17](#) .
- Remove front right footwell air duct ⇒ [page 17](#) .
- Remove fixing screws -1- from the universal joint and unhook the universal joint in the direction -arrow- ⇒ Running gear, ?? axles, ??steering; Rep. Gr. 48 ; Steering .



- Loosen the fastening screws -1- from the plenum chamber -2-.
- Remove the transversal support ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Remove the supports (right and left) from the dash support ⇒ Body - internal mountings; Rep. Gr. 70 ; Lining / Insulation .
- Carefully separate the plenum chamber from the dash and disconnect the connectors from the plenum chamber.
- Remove the plenum chamber.



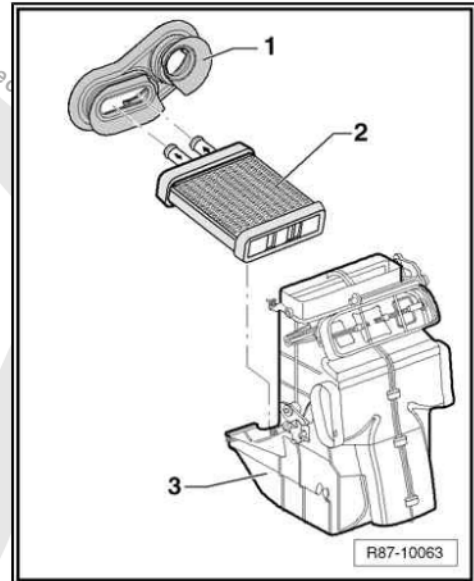
6.1.2 Installation

Install by inverting the removal sequence, paying attention to the following:

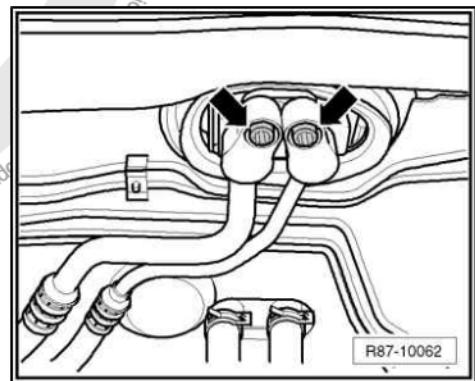
- Reassemble the harnesses and all the connectors in their original positions.



- Observe the installation position of the seal -1- and of the hoses on the heat exchanger -2- ⇒ [page 63](#) .



- Tighten the fastening screws -arrows- for the cooling gas circuit lines, with 10 Nm of torque.

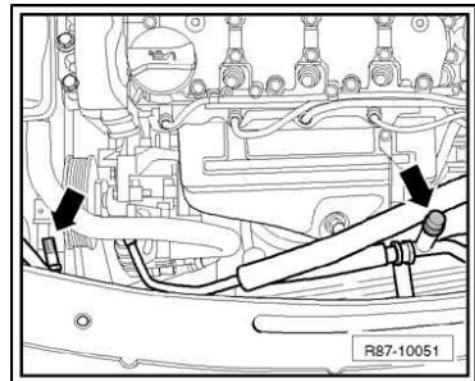


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Check the amount of gas supplied ⇒ [page 111](#) .



Note

Due to removal or replacement of heat exchanger, the cooling system will contain air. In order to remove the air, proceed as follows:



- Start the engine and keep it revved at 2500 rpm until coolant level in the tank lowers after the thermostat valve opens (the air that was in the heat exchanger is moved to the coolant tank, causing the coolant level there to decrease).
- Top up coolant tank ⇒ Engine; Rep. Gr. 19 ; Cooling system .

6.2 Evaporator housing - general overview of assembly



1 - Sealing

- ☐ Replace if damaged

2 - Air distributor box in upper section

- ☐ Do not remove
- ☐ With temperature and air distributor hatch

3 - Control motor for the fresh air valve and the recirculation valve -V154-

- ☐ Remove and install
⇒ [page 46](#)

4 - Air distributor box in lower section

5 - Clamp

- ☐ Replace if damaged

6 - Fresh air fan -V2-

- ☐ Remove and install
⇒ [page 13](#)

7 - Clamp

- ☐ Replace if damaged

8 - Fresh air fan pre-resistor with overheating fuse -N24-

- ☐ Remove and install
⇒ [page 14](#)

9 - Heating equipment harnesses

10 - Dust and pollen filter

- ☐ Remove and install
⇒ [page 14](#)

11 - Air distribution command cable

- ☐ Remove and install ⇒ [page 21](#)

12 - Temperature command cable

- ☐ Remove and install ⇒ [page 21](#)

13 - Air distributor chamber

14 - Screw

- ☐ 1.5 Nm

15 - Evaporator

- ☐ Remove and install the plenum chamber ⇒ [page 64](#)

16 - Heat exchanger

- ☐ Remove and install ⇒ [page 47](#)

17 - Sealing rings

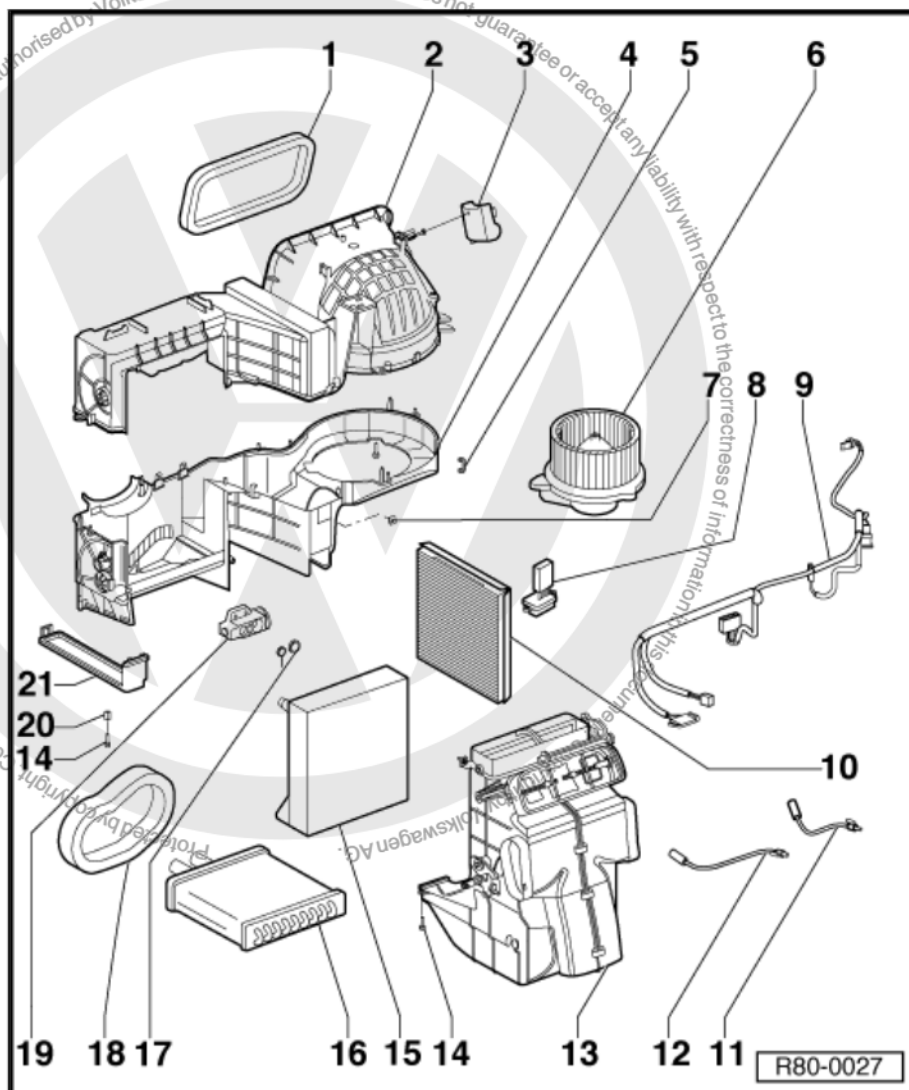
- ☐ Replace

18 - Heat exchanger sealing

- ☐ Replace if damaged

19 - Expansion valve

- ☐ Remove and Install ⇒ [page 105](#)





20 - Bushing

21 - Dust and pollen filter cover

6.3 Cooling gas loop (engine compartment)



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ⇒ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.*
- ◆ *When the Battery -A- is checked, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.*
- ◆ *Only the components tagged with asterisk (*) can be replaced without being opened or without sucking out the cooling loop gas.*





1 - High pressure sensor -G65-
(*)

- ☐ Remove and install
⇒ [page 74](#)
- ☐ Replacement of the
sealing rings (note num-
ber of parts)
- ☐ 8 Nm

2 - Service valve

- ☐ Environmental contami-
nation by the cooling
gas is a punishable of-
fence
- ☐ Low pressure side

3 - Cable support (*)

4 - Air intake opening (*)

- ☐ Under the windshield
covering in lower area

5 - Hose

- ☐ High pressure
- ☐ From fluid tank to evap-
orator

6 - Hose

- ☐ Low pressure
- ☐ From evaporator to
compressor

7 - Expansion valve housing

- ☐ Replace if damaged

8 - Expansion valve

- ☐ Remove and install
⇒ [page 105](#)

9 - Water outlet valve (*)

- ☐ Check ⇒ [page 63](#)

10 - Heat exchanger chamber

- ☐ Replace if damaged

11 - Condenser

- ☐ Remove and install ⇒ [page 96](#)

12 - Pressure relief valve

- ☐ Check ⇒ [page 75](#)

13 - Compressor

- ☐ Remove and install ⇒ [page 93](#)
- ☐ Observe notes for replacing the compressor ⇒ [page 95](#)

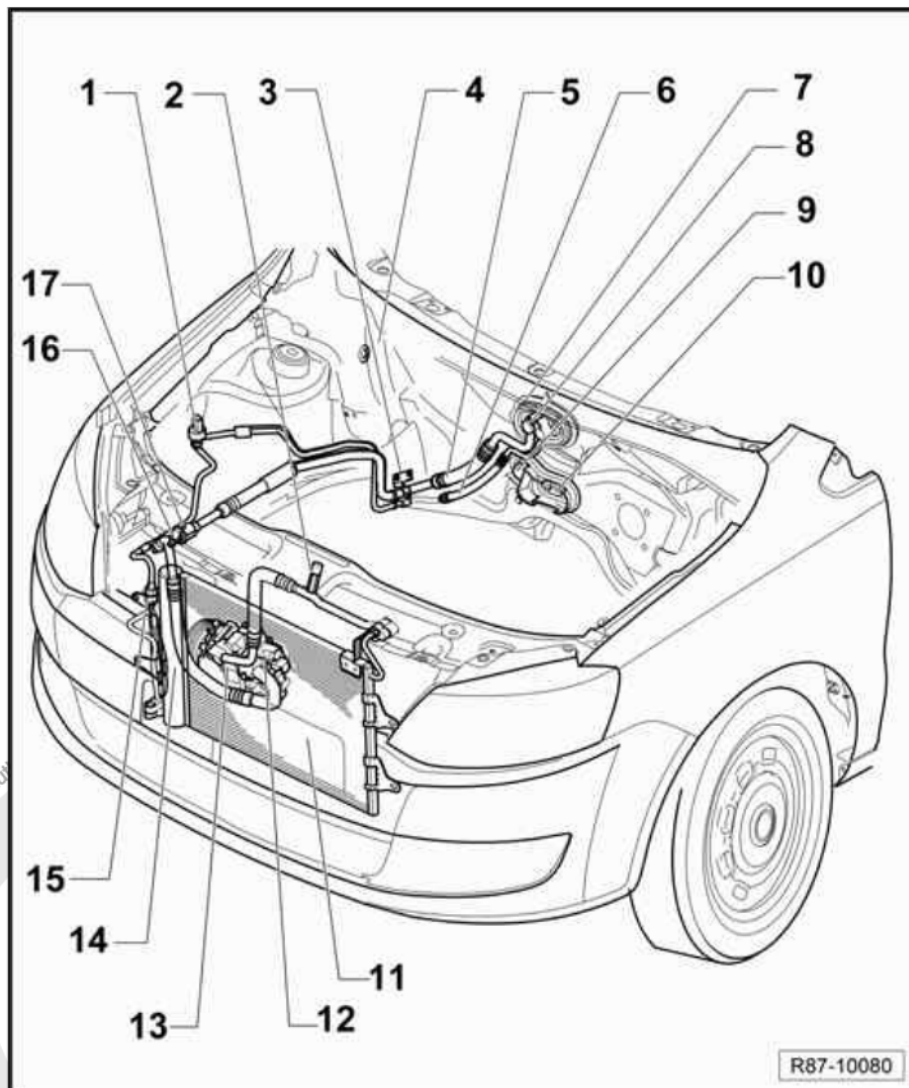
14 - Drying filter tank

15 - Rapid coupling

- ☐ Remove and install ⇒ [page 107](#)
- ☐ High pressure side

16 - Service valve

- ☐ Environmental contamination by the cooling gas is a punishable offence
- ☐ High pressure side





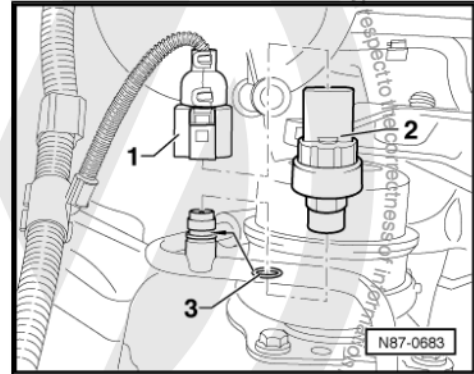
17 - Rapid coupling

- ☐ Remove and install ⇒ [page 107](#)
- ☐ Low pressure side

6.4 High pressure sensor -G65- - remove and install

6.4.1 Removal

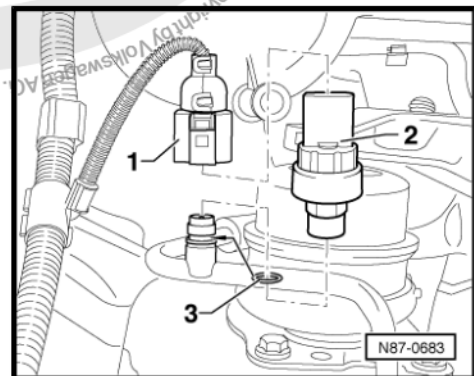
- Remove power connector -1-.
- Unscrew and remove the High pressure sensor -G65- -2-.



6.4.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Replace the sealing ring -3-.
- Tighten the High pressure sensor -G65- with a torque of 8 Nm.



6.5 High pressure sensor -G65- - check

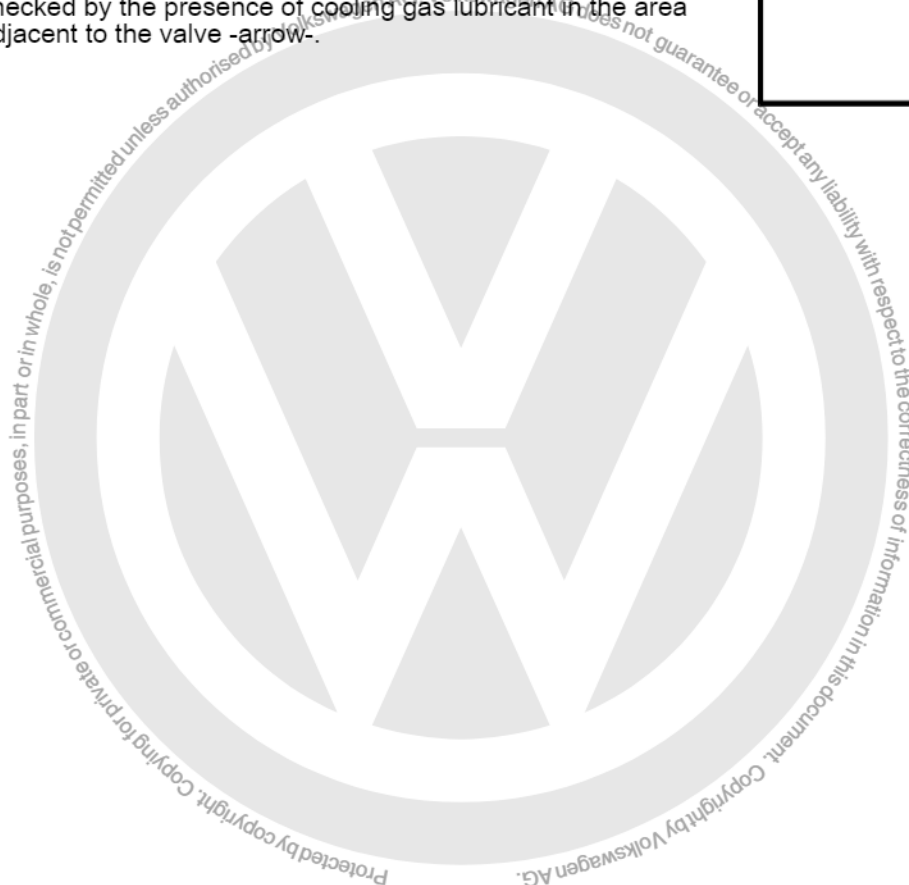
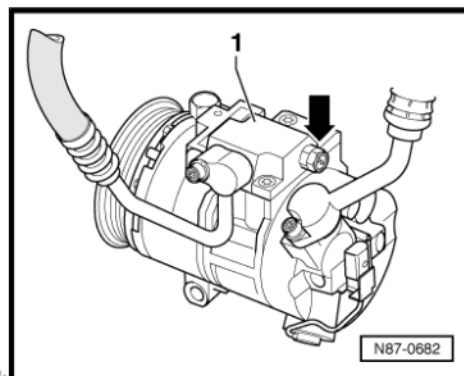
- Connect the Diagnosis, Measurement and Information System -VAS 5052- or later equipment.
- Proceed by selecting the desired functions ⇒ Vehicle diagnosis, testing and information system VAS 5051.



6.6 Pressure relief valve in the compressor - check

Check the pressure relief valve on compressor:

- ◆ Valve opening pressure (40 ± 4 bar).
- ◆ Valve closing pressure (31 bar).
- ◆ The activation (opening) of the overpressure valve can be checked by the presence of cooling gas lubricant in the area adjacent to the valve -arrow-.



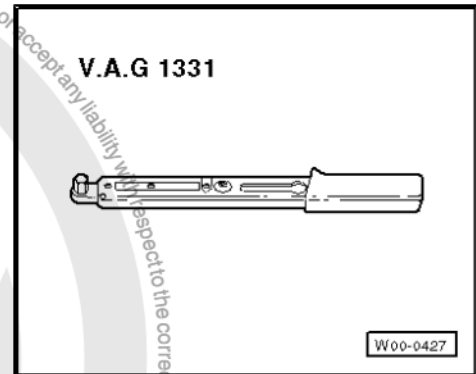


7 Support for air conditioning compressor (up to model-year 2010)

7.1 Air conditioning compressor support - remove and install

Special tools and workshop equipment required

- ◆ Torque wrench -5 to 50 Nm (socket 1/2") -VAG 1331-



Note

- ◆ *The compressor support and respective components can be removed and installed without the need for opening the cooling gas loop.*
- ◆ *In order to remove Poly-V belt: ⇒ Engine; Rep. Gr. 13; Engine - disassemble and assemble .*



1 - Compressor support

Removal

- Remove the power steering pump and remove it ➔ Chassis, Axles, Steering; Rep. Gr. 48 ; Hydraulic pump, compensation reservoir, hydraulic tubing; Hydraulic pump installed in upper section - remove and install .
- Removing alternator ➔ Electrical equipment; Rep. Gr. 27 ; Alternator with Poly-V belt - remove and install .
- Remove the compressor ➔ [Item 7 \(page 77\)](#) .
- Remove screws -2, 3, 4, and 5- and remove the engine block support.

Installation

Install by inverting the removal sequence, paying attention to the following:

- Replace fastening screws.
- Observe the following fixing screws tightening sequence:
- ◆ First tighten the hexagonal screws -3 and 5-; tighten hexagonal screws -2 and 4-.

2 - Hexagon screw

- ☐ M 10x85
- ☐ 50 Nm

3 - Hexagon screw

- ☐ M 10x85
- ☐ 50 Nm

4 - Hexagon screw

- ☐ M 10x50
- ☐ 50 Nm

5 - Hexagon screw

- ☐ M 10x50
- ☐ 50 Nm

6 - Bungs

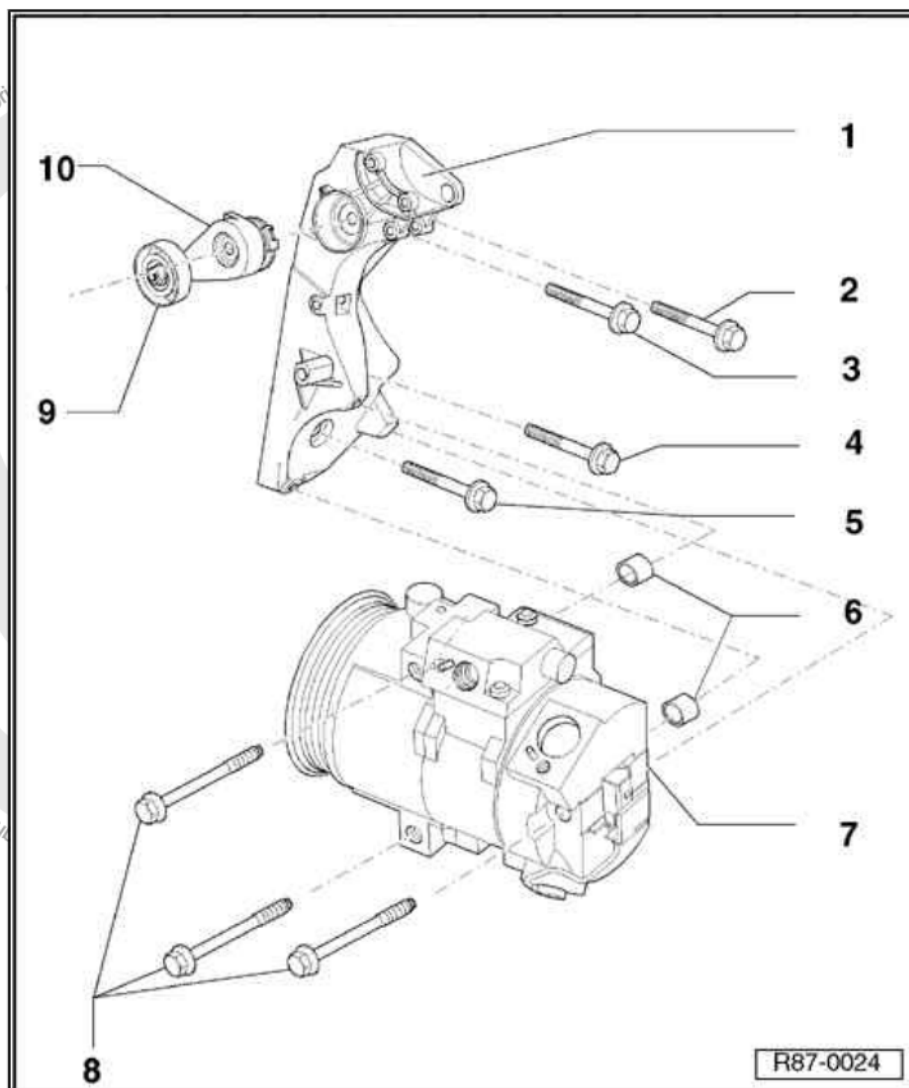
7 - Compressor

Removal

- Remove hexagon screws -8-.
- Remove compressor from support and fasten it to body ➔ [page 78](#)

Installation

Install by inverting the removal sequence, paying attention to the following:





❑ Poly-V belt run ➔ [page 78](#)

8 - Hexagon screw

❑ M 8x100

❑ 23 Nm

9 - Poly-V belt tensioner pulley

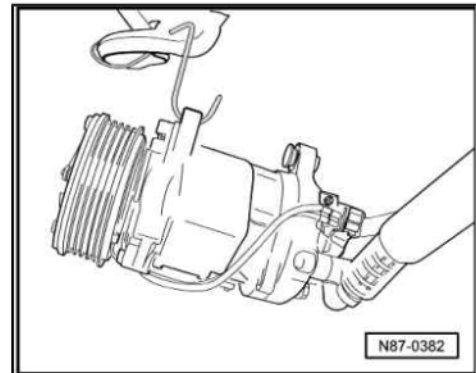
❑ 45 Nm

10 - Tensioning element of the tensioner pulley

Fixation of the air conditioning compressor to the body

If the air conditioning compressor is removed without opening the refrigerant gas circuit, the compressor shall be fixed to the body with a suitable auxiliary material, for example, a welding wire.

Make sure that the flexible cooling gas hoses on the compressor remain unstressed.



Poly-V belt run

1 - Hydraulic steering oil pump pulley

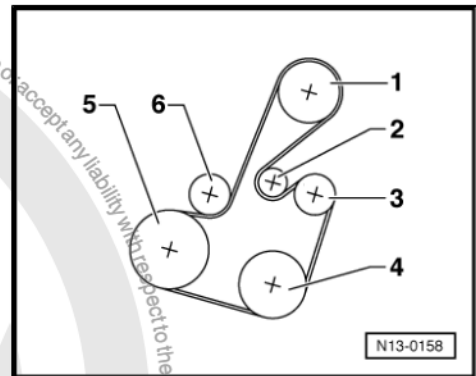
2 - Return pulley

3 - Alternator pulley

4 - Air conditioning compressor pulley

5 - Crankshaft pulley

6 - Tensioner pulley



Note

When installing the belt, ensure that the pulley is correctly positioned.



7.2 Air conditioning magnetic coupling - N25- manufacturer Delphi - repair



Note

- ◆ In order to repair the Air conditioning magnetic coupling -N25-, with the compressor installed, it is not necessary to open the cooling gas loop.
- ◆ Only in exceptional or extreme situations should the magnetic coupling be repaired with the compressor installed.
- ◆ If the compressor must be removed, suck out the cooling gas with the Assembly for climatizer recovery, recycling and recharge or EQ 7098 -VAS 6008- ➔ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; The use of the Assembly for climatizer recovery, recycling and recharge or EQ 7098 -VAS 6008- .
- ◆ In vehicles with Diesel engines, it is necessary to remove the "intercooler" ➔ Engine; Rep. Gr. 21 ; Intercooler - remove and install .

1 - Control valve with retaining ring set

2 - High pressure relief valve set

3 - Retaining ring

☐ Replace

4 - Rotor

5 - Felt ring

☐ Replace

6 - Retaining ring

☐ Replace

7 - Adjusting washers

8 - Coupling disc

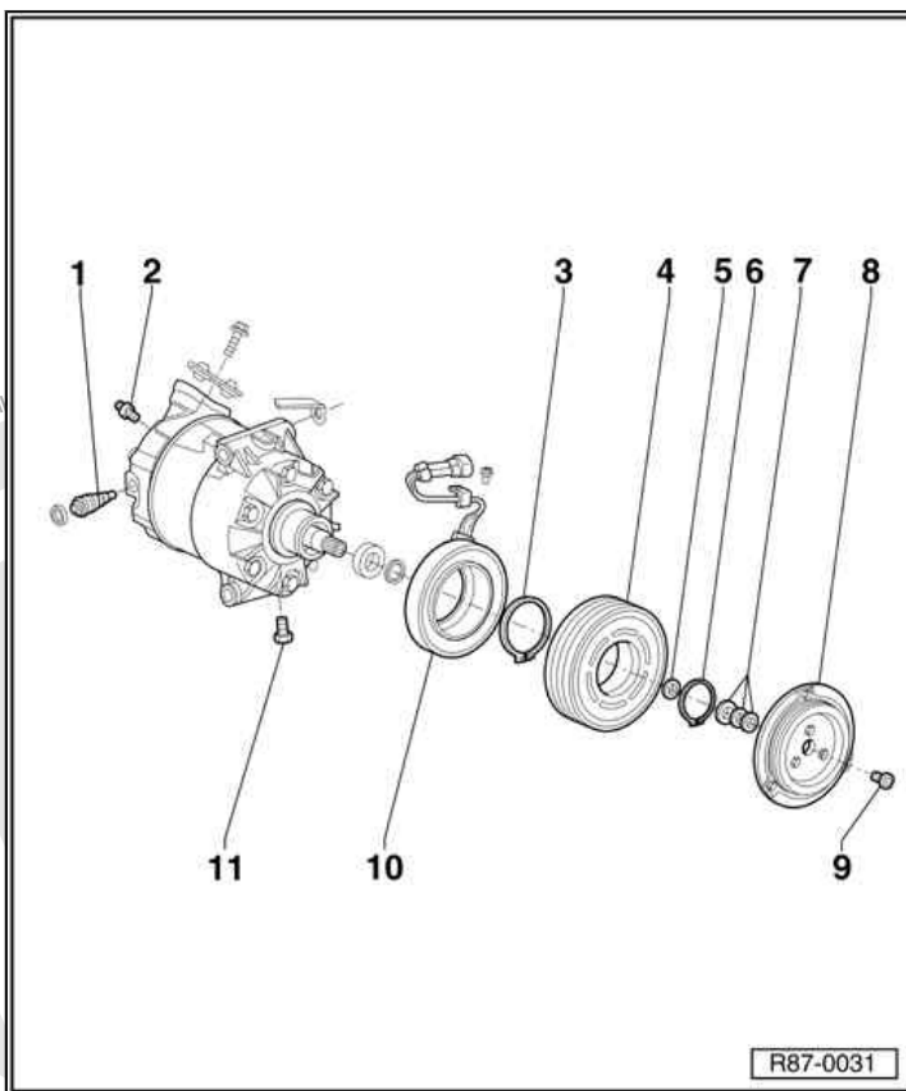
9 - 9.0...12.0 Nm

☐ Replace

10 - Stator

11 - Drainage screw

☐ 16.0...19.0 Nm

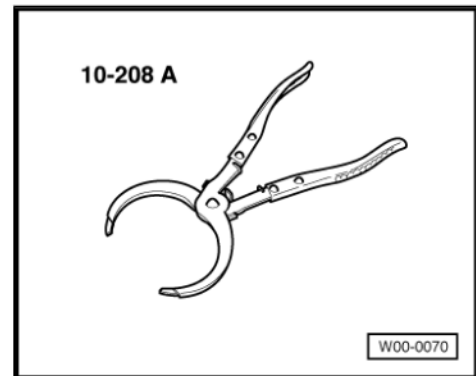




7.3 Electromagnetic clutch (Delphi compressor) - remove and install

Special tools and workshop equipment required

- ◆ Pliers -10-208A-



7.3.1 Removal

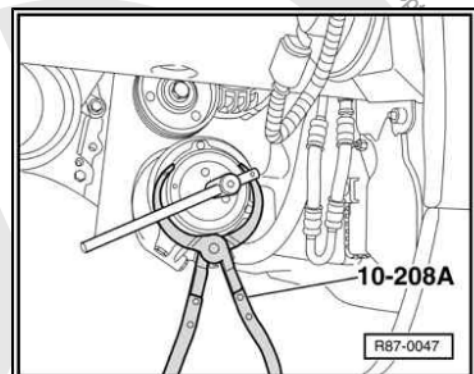
- Remove the engine lower noise damper.
- Remove the front right wheelhouse protection.
- Remove the Poly-V belt.
- Mark the belt operating direction.
- Disconnect the harness connector from the electromagnetic clutch.
- Remove the coupling disc with the help of Pliers -VW 10-208A- and Gedore socket -T30- .



Note

While removing the disc, take care not to lose the adjustment washers.

- Remove the lock and the rotor.
- Remove the lock and the stator.



7.3.2 Installation

Installation is carried out in the reverse order of removal.



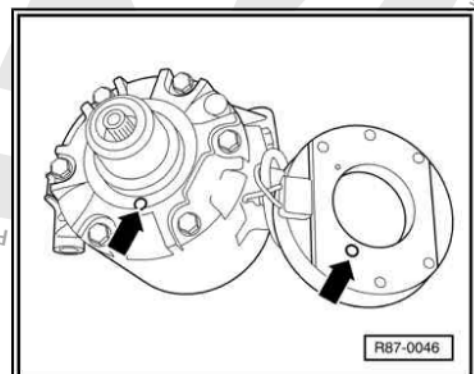
Note

While installing the stator, observe the locking position in the compressor -arrows-.



Note

In case of replacement of the hub or the stator, use a proper amount of adjustment washers.



Therefore, check the distance between the hub and the pulley.

- The distance must be between 0.3 and 0.6 mm.



8 Support for air conditioning compressor (as from model-year 2011)



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery



Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.
- ◆ When the Battery -A- is checked, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

Special tools and workshop equipment required

- ◆ Torque wrench - 5 to 50 Nm (socket 1/2") -VAG 1331-

V.A.G 1331



W00-0427

- ◆ Torque wrench 40 - 200 Nm -VAG 1332-

V.A.G 1332



W00-0428



8.1 Air conditioning compressor support - remove and install



Note

- ♦ The compressor support and respective components can be removed and installed without the need for opening the cooling gas loop.
- ♦ To remove and install the Poly-V belt (elastic): ⇒ Engine; Rep. Gr. 13 ; Crankshaft, pistons .

1 - Compressor support

Removal:

- Remove the power steering pump and remove it ⇒ Chassis, Axles, Steering; Rep. Gr. 48 ; Steering .
- Remove the Generator (Alternator) -C- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .
- Remove compressor from support and fasten it to body ⇒ [Item 5 \(page 83\)](#) .
- Remove the attaching screws -2- and remove the engine block support -1-.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Replace fastening screws.
- Install the fastening screws -2- tightening them in cross pattern with a torque of 50 Nm.

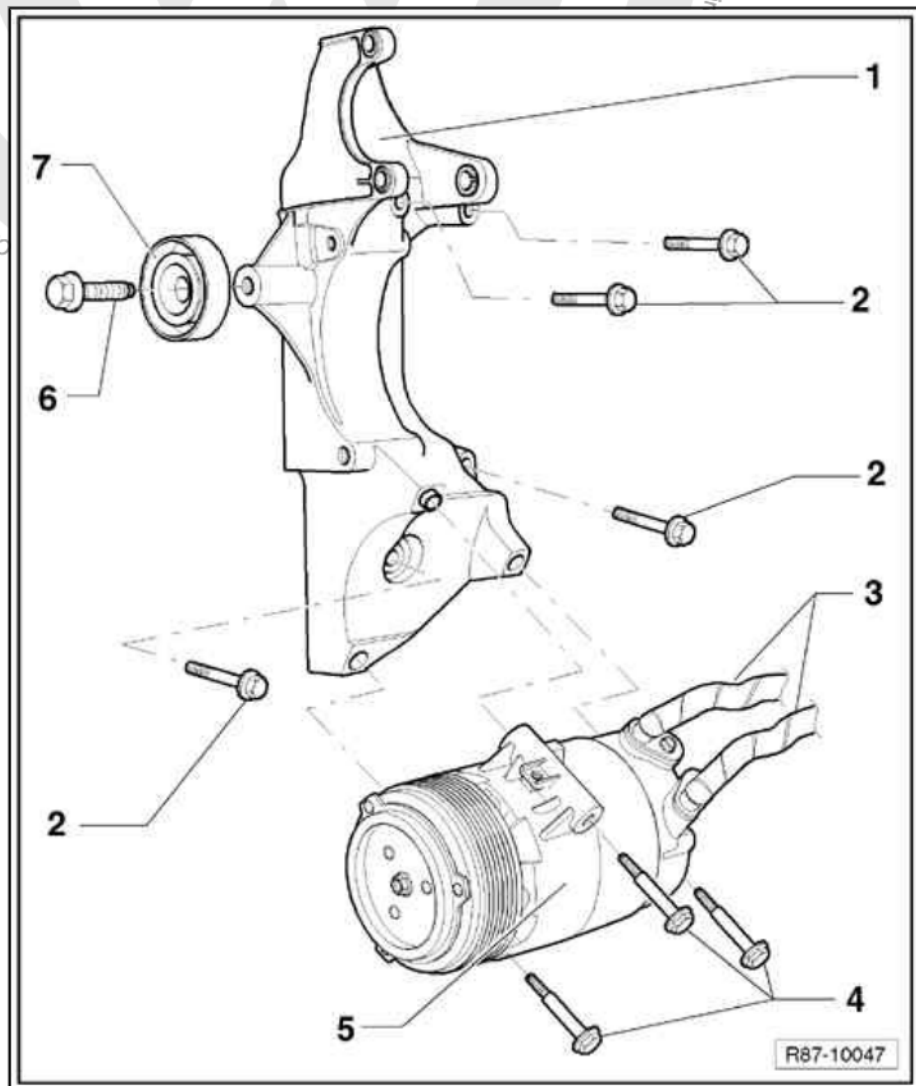
2 - Screw

- ☐ Replace whenever removed
- ☐ 4 units
- ☐ 50 Nm

3 - Cooling system hoses

4 - Screw

- ☐ Replace whenever removed
- ☐ 3 units
- ☐ 23 Nm





5 - Compressor

Removal:

- Remove Poly-V belt ⇒ Engine; Rep. Gr. 13 ; Crankshaft, pistons .
- Remove the attaching screws -4-.
- Remove compressor from support and fasten it to body ⇒ [page 83](#)

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Replace fastening screws.
- Tighten the compressor fastening screws -4- with a torque of 23 Nm.
- Check Poly-V belt trajectory ⇒ [page 84](#) .



Note

If the compressor needs to be completely removed, see ⇒ [page 93](#)

6 - Screw

- ☐ Replace whenever removed
- ☐ 45 Nm

7 - Reversing pulley.

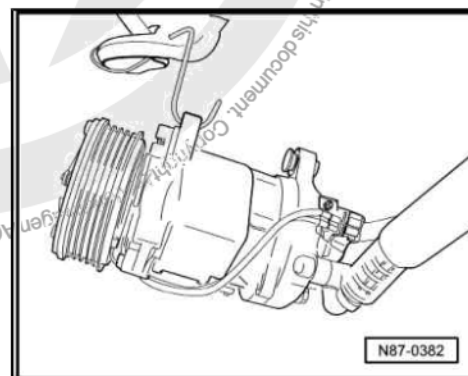
Air conditioning compressor fastening to the body:

If the air conditioning compressor is removed and the cooling gas loop is not opened, the compressor must be fastened to the body with a suitable auxiliary mean, such as a wire. If the compressor needs to be completely removed, see ⇒ [page 93](#) .



Note

Make sure that the flexible cooling gas hoses on the compressor remain unstressed.





Poly-V belt (elastic) trajectory:

A - Poly-V belt (elastic) of the power steering oil pump and the Generator (Alternator) -C- .

B - Poly-V belt (elastic) of the air conditioning compressor.

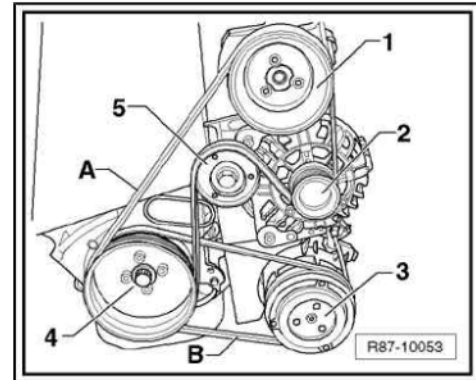
1 - Power steering oil pump pulley.

2 - Generator (Alternator) Generator (Alternator) -C- .

3 - Air conditioning compressor pulley.

4 - Crankshaft pulley.

5 - Reversing pulley.



Note

When installing the belt, ensure that the pulley is correctly positioned.





9 Cooling gas loop



WARNING

Before working on the heating and air conditioning system, it is necessary to disconnect the earth strap of Battery -A- ➔ Electrical equipment; Rep. Gr. 27; Starter, alternator, battery.



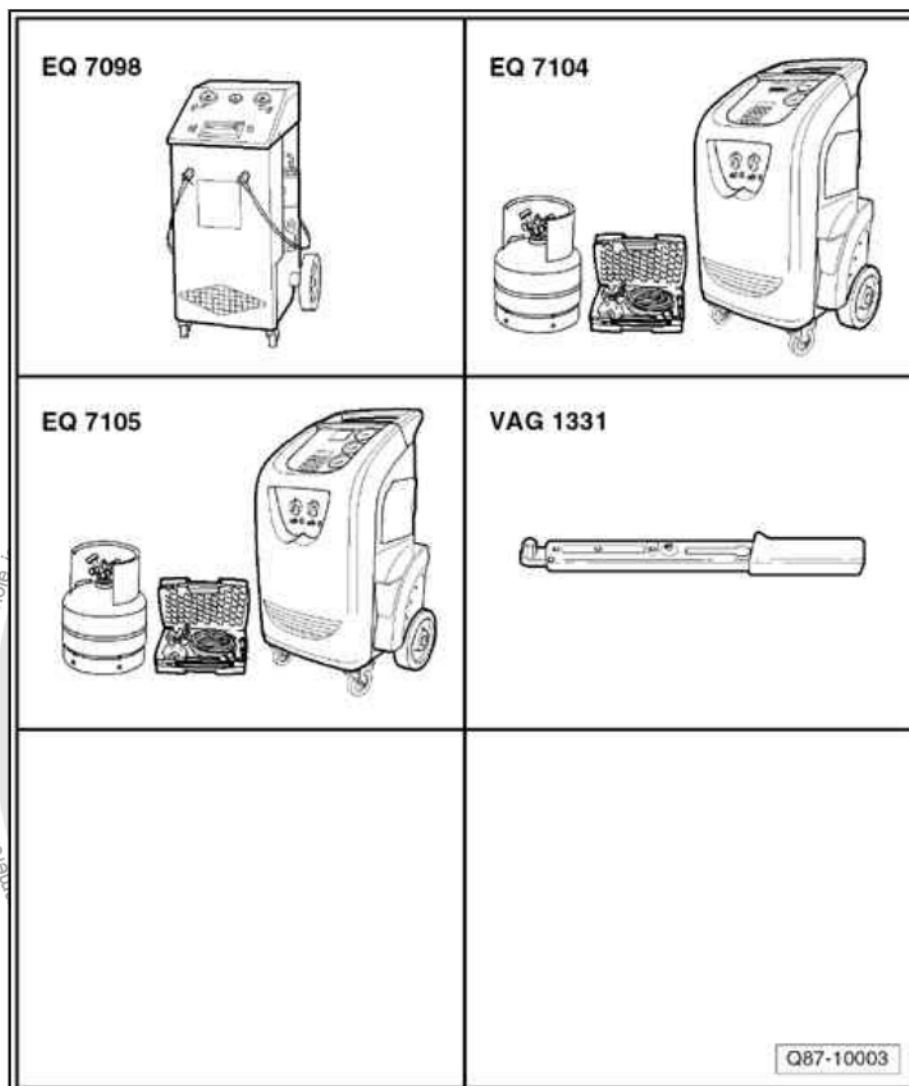
Note

- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A-.*
- ◆ *When the Battery -A-, check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.*
- ◆ *Repairs to the cooling gas loop must only be executed at authorized and specialized technical assistance workshops.*
- ◆ *The cooling gas must be extracted with the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment ➔ Air conditioning with R134a cooling gas; Rep. Gr. 00; Technical data.*
- ◆ *Instructions on repair work on vehicles with air conditioning system and how to handle the cooling gas ➔ [page 50](#).*
- ◆ *All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.*
- ◆ *The color identification of cooling gas loop sealing rings with R134a is no longer used. Black sealing rings are now used.*



Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7105-
- ◆ Torque wrench - 5 to 50 Nm (socket 1/2") -VAG 1331-



Note

For instructions on additional tools and instructions on how to carry out repairs in vehicles with air conditioning and how to handle cooling gas can be found in the ELSA system ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

9.1 Cooling gas loop - general overview of assembly



Note

Only the components tagged with asterisk (*) can be replaced without being opened or without sucking out the cooling loop gas.

(Delphi Condenser):



1 - High pressure sensor -G65-
(*)

- ☐ Remove and install
⇒ [page 74](#)
- ☐ Check ⇒ [page 74](#)

2 - Nuts

- ☐ 1.9 ± 0.1 Nm

3 - Screw

- ☐ 10 ± 1 Nm

4 - Expansion valve

- ☐ Remove and install
⇒ [page 105](#)

5 - Seal ring

- ☐ Replace
- ☐ 11.10 mm; 1.78 mm

6 - Seal ring

- ☐ Replace
- ☐ 17.17 mm; 1.78 mm

7 - Seal ring

- ☐ Replace
- ☐ 10.8 mm; 1.82 mm

8 - Seal ring

- ☐ Replace
- ☐ 14.30 mm; 2.40 mm

9 - Hose

- ☐ High pressure
- ☒ From the drying filter container to the evaporator

10 - Nut

- ☐ 1.9 ± 0.1 Nm

11 - Evaporator

12 - Thrust plate

13 - Service valve

- ☐ High pressure
- ☐ Location ⇒ [page 51](#)
- ☐ Environmental contamination by the cooling gas is a punishable offence
- ☐ Filling capacities ⇒ [page 111](#)

14 - Screw

- ☐ 5 ± 0.5 Nm

15 - Screw

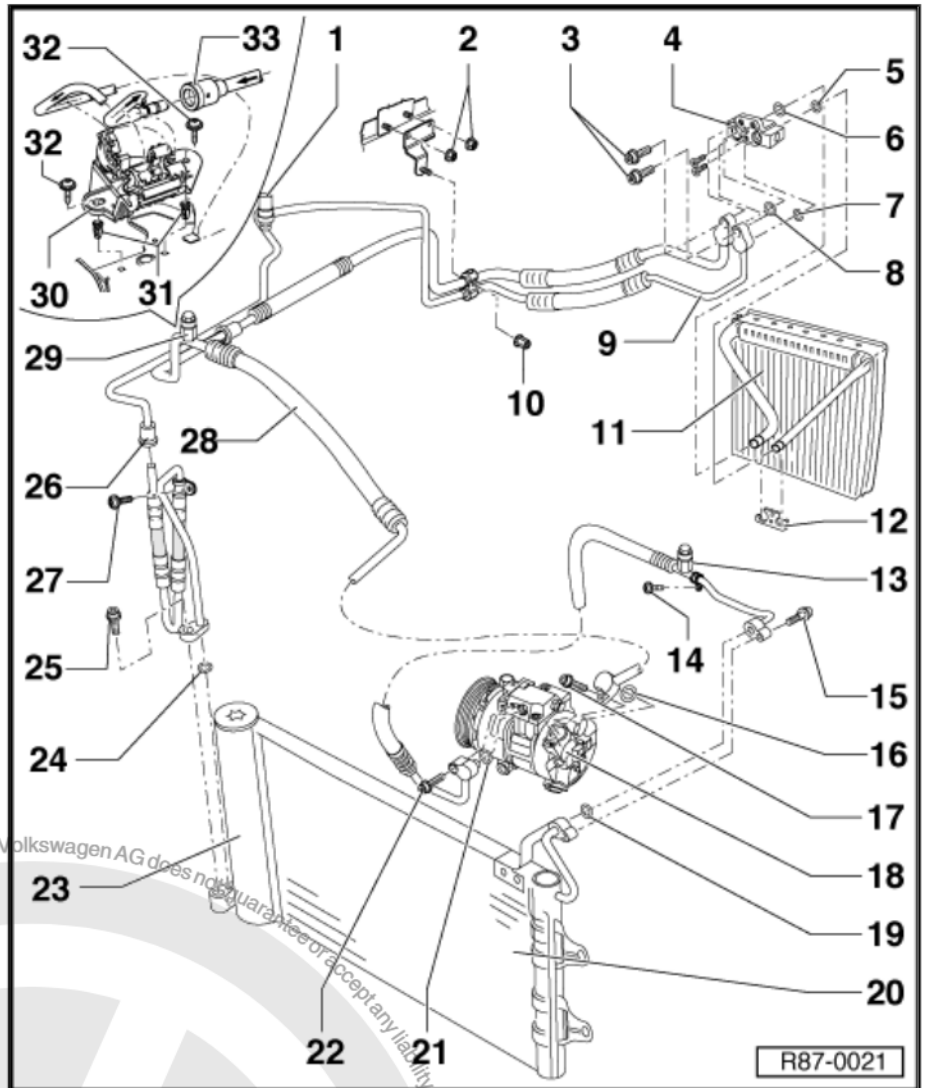
- ☐ 12 ± 1 Nm

16 - Seal ring

- ☐ Replace
- ☐ 14.3 mm; 2.4 mm

17 - Screw

- ☐ 22 ± 1 Nm





- 18 - Compressor
 - ☐ Remove and install ⇒ [page 93](#)
- 19 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 20 - Condenser
 - ☐ Remove and install ⇒ [page 96](#)
- 21 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 22 - Screw
 - ☐ 22 ± 1 Nm
- 23 - Dryer filter receiver
 - ☐ Remove the filtering element ⇒ [page 101](#)
- 24 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 25 - Screw
 - ☐ 12 ± 1 Nm
- 26 - Rapid coupling
 - ☐ Remove and install ⇒ [page 107](#)
- 27 - Screw
 - ☐ 5 ± 0.5 Nm
- 28 - Hose
 - ☐ Low pressure
 - ☐ From the evaporator to the compressor
- 29 - Service valve
 - ☐ Low pressure
 - ☐ Location ⇒ [page 51](#)
 - ☐ Environmental contamination by the cooling gas is a punishable offence
 - ☐ Filling capacities ⇒ [page 111](#)
- 30 - Line support
- 31 - Bungs
- 32 - Screw
 - ☐ 1.8 ± 0.2 Nm
- 33 - Rapid coupling
 - ☐ Remove and install ⇒ [page 107](#)

(Denso Condenser):



1 - High pressure sensor -G65-
(*)

- ☐ Remove and install
⇒ [page 74](#)
- ☐ Check ⇒ [page 74](#)

2 - Nuts

- ☐ 1.9 Nm

3 - Screw

- ☐ 10 ± 1 Nm

4 - Expansion valve

- ☐ Remove and install
⇒ [page 105](#)

5 - Seal ring

- ☐ Replace
- ☐ 11.10 mm; 1.78 mm

6 - Seal ring

- ☐ Replace
- ☐ 17.17 mm; 1.78 mm

7 - Seal ring

- ☐ Replace
- ☐ 10.8 mm; 1.82 mm

8 - Seal ring

- ☐ Replace
- ☐ 14.30 mm; 2.40 mm

9 - Hose

- ☐ High pressure
- ☐ From the drying filter container to the evaporator

10 - Nut

- ☐ 1.9 ± 0.1 Nm

11 - Evaporator

12 - Thrust plate

13 - Service valve

- ☐ High pressure
- ☐ Location ⇒ [page 51](#)
- ☐ Environmental contamination by the cooling gas is a punishable offence
- ☐ Filling capacities ⇒ [page 111](#)

14 - Screw

- ☐ 5 ± 0.5 Nm

15 - Screw

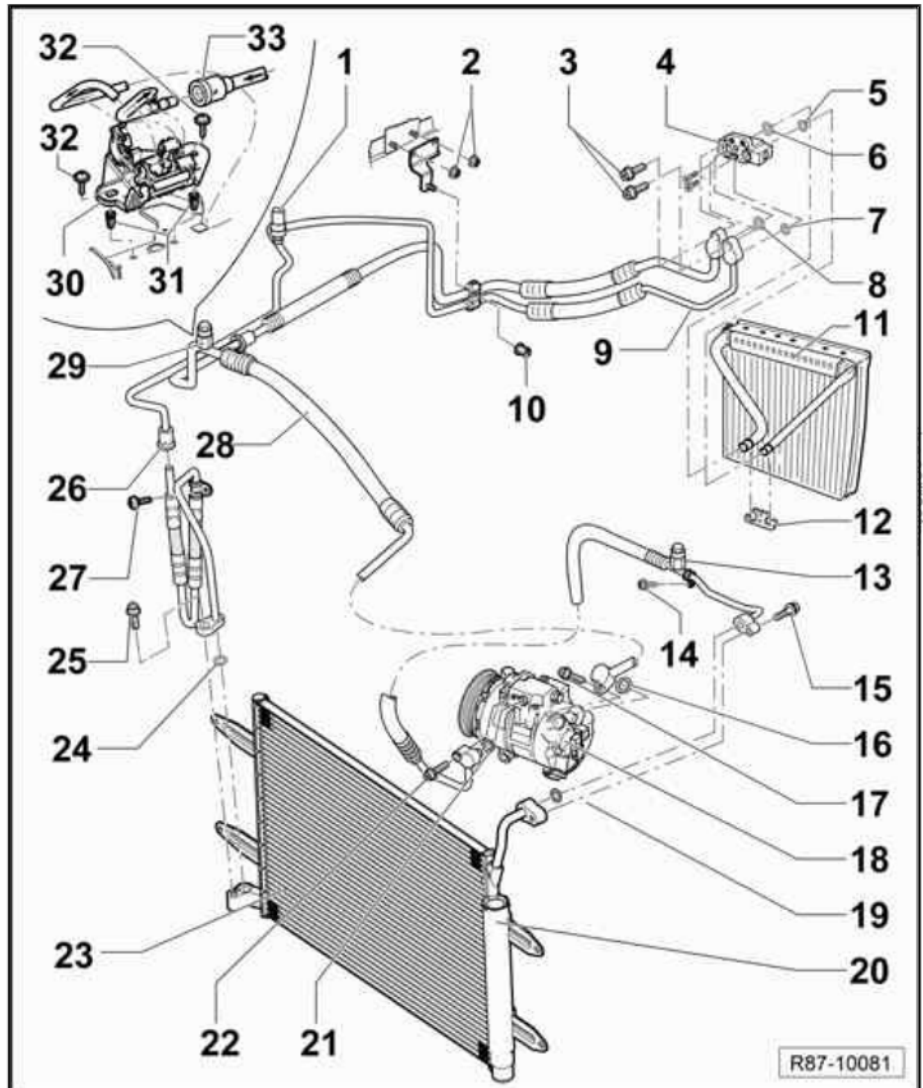
- ☐ 12 ± 1 Nm

16 - Seal ring

- ☐ Replace
- ☐ 14.3 mm; 2.4 mm

17 - Screw

- ☐ 22 ± 1 Nm





- 18 - Compressor
 - ☐ Remove and install ⇒ [page 93](#)
- 19 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 20 - Dryer filter receiver
 - ☐ Remove the filtering element ⇒ [page 101](#)
- 21 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 22 - Screw
 - ☐ 22 ± 1 Nm
- 23 - Condenser
 - ☐ Remove and install ⇒ [page 96](#)
- 24 - Seal ring
 - ☐ Replace
 - ☐ 10.8 mm; 1.82 mm
- 25 - Screw
 - ☐ 12 ± 1 Nm
- 26 - Rapid coupling
 - ☐ Remove and install ⇒ [page 107](#)
- 27 - Screw
 - ☐ 5 ± 0.5 Nm
- 28 - Hose
 - ☐ Low pressure
 - ☐ From the evaporator to the compressor
- 29 - Service valve
 - ☐ Low pressure
 - ☐ Location ⇒ [page 51](#)
 - ☐ Environmental contamination by the cooling gas is a punishable offence
 - ☐ Filling capacities ⇒ [page 111](#)
- 30 - Line support
- 31 - Bungs
- 32 - Screw
 - ☐ 1.8 ± 0.2 Nm.
- 33 - Rapid coupling
 - ☐ Remove and install ⇒ [page 107](#)



9.2 Air conditioning magnetic coupling - N25- manufacturer (Delphi) - repair

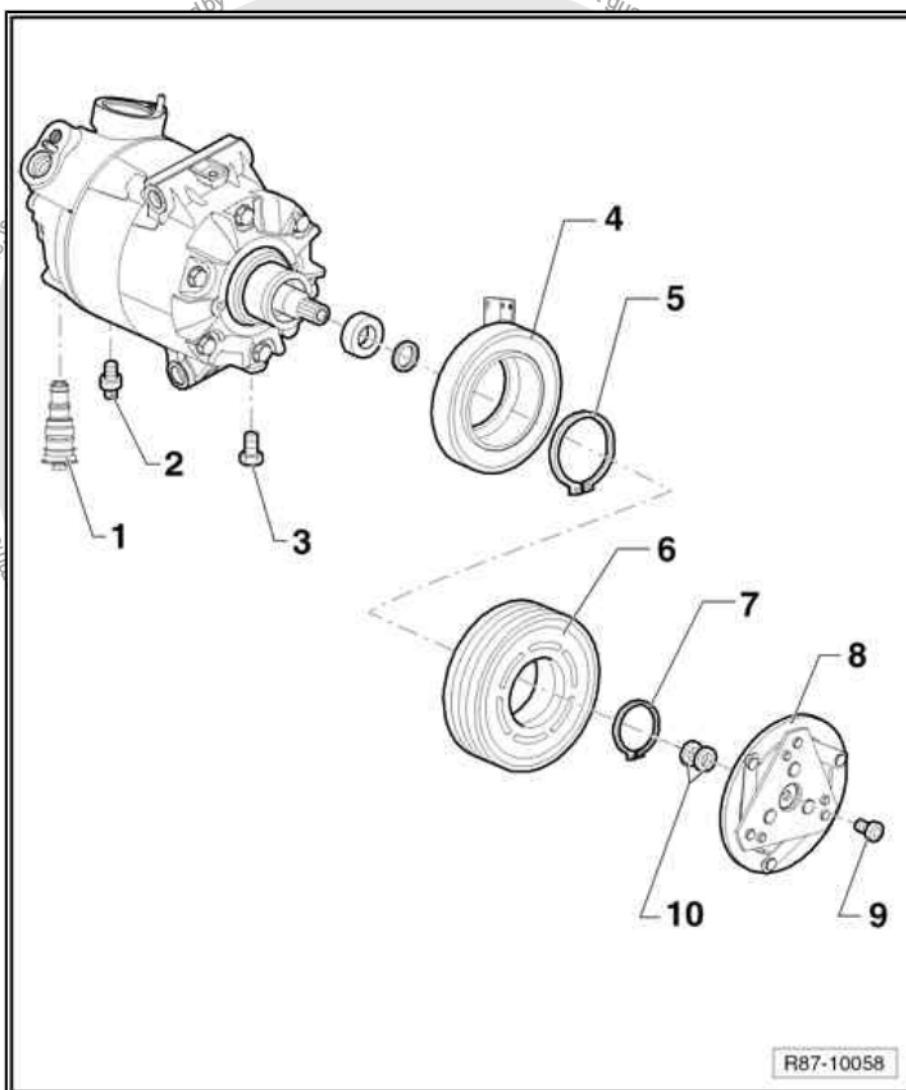


Note

- ◆ In order to repair the Air conditioning magnetic coupling -N25-, with the compressor installed, it is not necessary to open the cooling gas loop.
- ◆ Only in exceptional or extreme situations should the magnetic coupling be repaired with the compressor installed.
- ◆ If the compressor must be removed, suck out the cooling gas with the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment ➔ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

Air conditioning magnetic coupling -N25- - Assembly overview:

- 1 - Control valve with retaining ring set
- 2 - High pressure relief valve set
- 3 - Drainage screw
 - ☐ 16...19 Nm.
- 4 - Air conditioning magnetic coupling -N25-
 - ☐ Electromagnetic coil
- 5 - ?Lock ring
 - ☐ Replace
- 6 - Pulley
- 7 - ?Lock ring
 - ☐ Replace
- 8 - Coupling disc
- 9 - Screw
 - ☐ Replace whenever removed
 - ☐ 9.5...12 Nm
- 10 - Adjusting washers

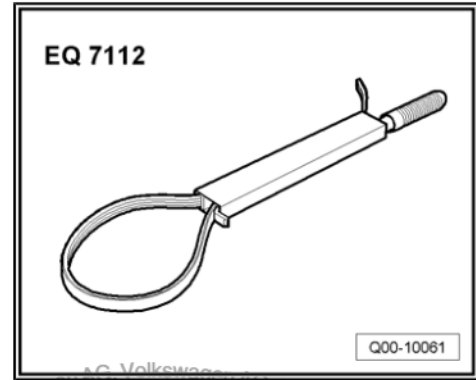


9.3 Electromagnetic clutch (Delphi compressor) - remove and install

Special tools and workshop equipment required



♦ Poly-V pulley locking rod -EQ 7112-



9.3.1 Removal

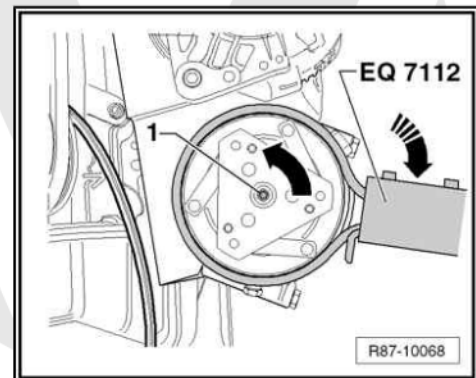
- Remove right front wheel case cover ⇒ Body - external mountings; Rep. Gr. 66 ; External equipment .
- Mark the belt operating direction.
- Remove the Poly-V (elastic) belt from the air conditioning compressor ⇒ Engine; Rep. Gr. 13 ; Crankshaft, pistons .
- Disconnect the harness connector from the Air conditioning magnetic coupling -N25- .
- Release the fastening screw -1- in the direction of -arrow- and simultaneously move the Poly-V Pulley locking rod -EQ 7112- clockwise as indicated by the -arrow-.
- Remove coupling disc from compressor.



Note

When removing the coupling disc, be careful not to lose the adjusting washers.

- Remove locking ring and pulley.
- Remove locking ring and Air conditioning magnetic coupling -N25- .



9.3.2 Installation

Install by inverting the removal sequence, paying attention to the following:



i Note

When installing the Air conditioning magnetic coupling -N25- observe locking position of compressor -arrows-.

i Note

In case of replacing the coupling disc and/or the Air conditioning magnetic coupling -N25-, use an appropriate amount of adjusting washers.

To do so, check the distance between the coupling disc and the pulley.

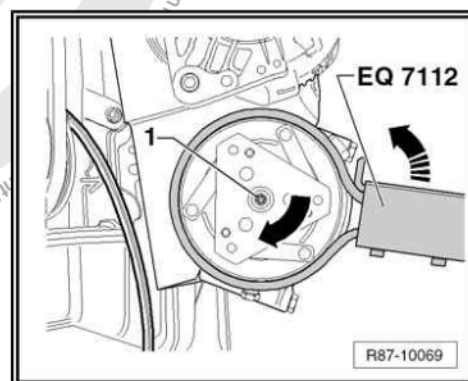
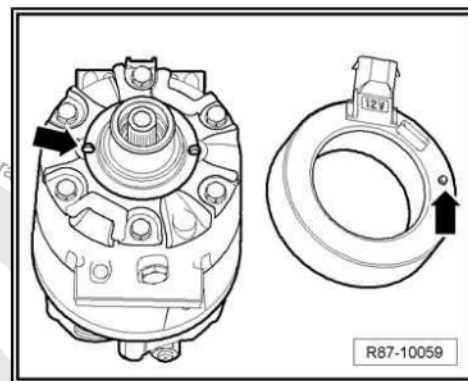
- The distance shall be between 0.3...0.6 mm.



WARNING

Replace the fastening screw from the coupling disc to the compressor shaft.

- Tighten the fastening screw -1- to a torque of 9.5 to 12 Nm observing the direction of the -arrow- and simultaneously move the Poly-V Pulley locking rod -EQ 7112- counter-clockwise as indicated by the -arrow-.



9.4 Compressor - remove and install



WARNING

When replacing the compressor, carefully remove the closing plug, so as to avoid releasing pressured gas. Accordingly, you will prevent the oil in the compressor from leaking.

The compressor must be installed with the same quantity of oil that it contained previously ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .



9.4.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Remove right front wheel case cover ⇒ Body - external mountings; Rep. Gr. 66 ; External equipment .



Note

Mark the belt operating direction:

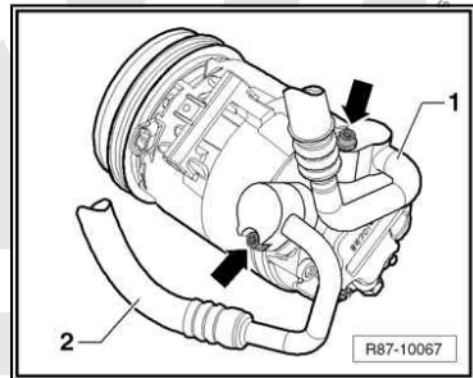
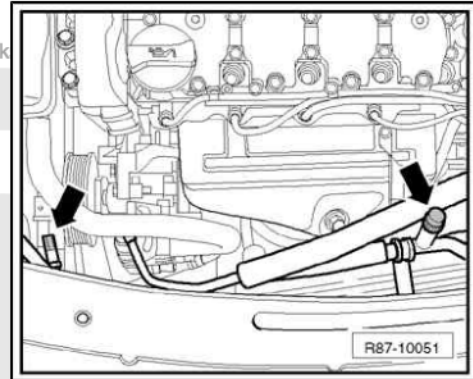
- Remove the Poly-V belt (elastic) ⇒ Engine; Rep. Gr. 13 ; Crankshaft, pistons .
- Disconnect the harness connector from the electromagnetic clutch.
- Loosen the fastening screws -arrows- and remove hoses -1- and -2- from the cooling system.



Note

All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.

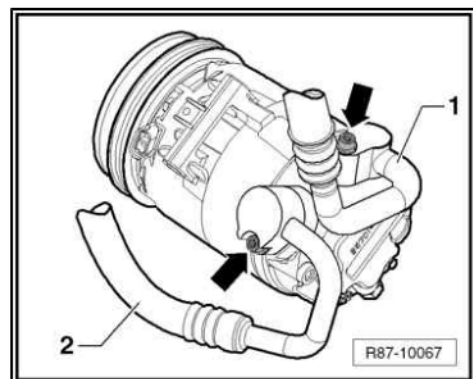
- Remove the compressor fastening screws:
- ♦ 1.0-liter and 1.6-liter engines ⇒ [page 82](#)
- Remove the compressor.



9.4.2 Installation

Install by inverting the removal sequence, paying attention to the following:

- Replace fastening screws.
- Observe the tightening sequence for fastening screws:
- ♦ 1.0-liter and 1.6-liter engines ⇒ [page 82](#)
- Install the air conditioning system hoses -1- and -2-.
- Tighten the fastening screws -arrows- with a torque of 22 Nm.





9.4.3 Instructions on installing a new compressor



WARNING

The compressor must be installed with the same quantity of oil that it contained previously ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

After filling the cooling gas loop, do not start the engine.

- After installing a new compressor or filling it with new cooling oil (for example, after purging the cooling gas loop), manually turn the Poly-V belt 10 times before starting the engine. This prevents damage to the compressor.



Note

Run the engine only with the cooling gas circuit closed.

- Start the engine with the compressor turned off and wait until the idling speed stabilizes.
- Open the instrument panel air baffles.
- In the air conditioning adjustment mechanism, select the position "Low" on the temperature selector, which corresponds to the lowest temperature in the system.
- Turn on the compressor (air conditioning) and keep it running for at least 5 minutes with the engine idling.



Note

- ◆ *Run the engine only with the cooling gas circuit closed in order not to damage the compressor.*
- ◆ *To prevent damage to the compressor, it is equipped with "an internal oil circuit". To enable this internal lubrication, the compressor must have a residual quantity of cooling gas lubricant, since when there is no gas in the system, the cooling gas lubricant is not carried to the compressor.*
- ◆ *A Adjustment valve for the air conditioning compressor -N280- is not activated when the cooling gas loop is empty. The compressor will spin, following the engine revving regime.*
- ◆ *If a compressor is locked, the overload protection is released from the compressor shaft. This can be observed when deformations are detected in the Poly-V belt, which are not always noticed, or by the presence of rubber dust in the Poly-V belt (elastic) grooves.*

If the engine must be started without any gas in the cooling system, observe the following items:

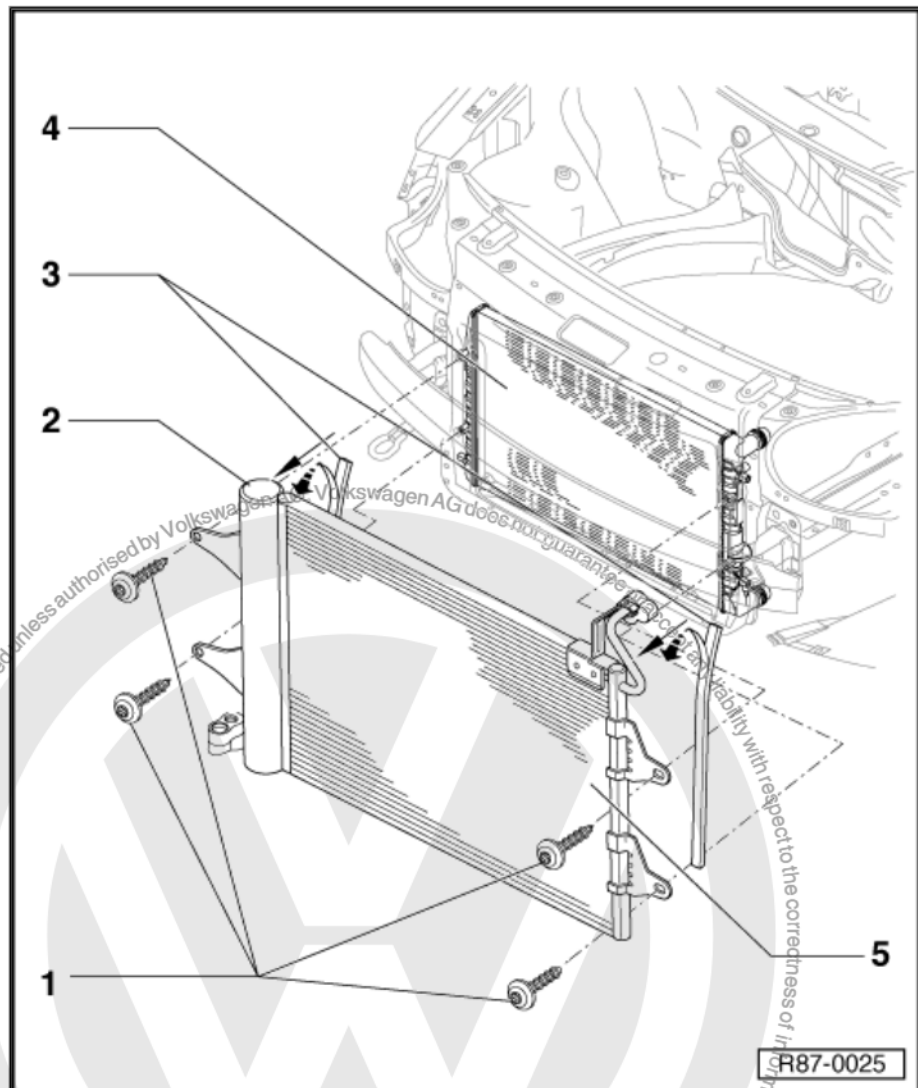
- ◆ The cooling gas loop must be completely installed and closed.
- ◆ The compressor must have at least one quarter of the oil level indicated for the cooling gas.
- ◆ The engine must not be revved above (2500 RPM), revolutions per minute.
- ◆ Run the engine only for the time required.



9.5 Condenser

General overview of assembly (Delphi condenser):

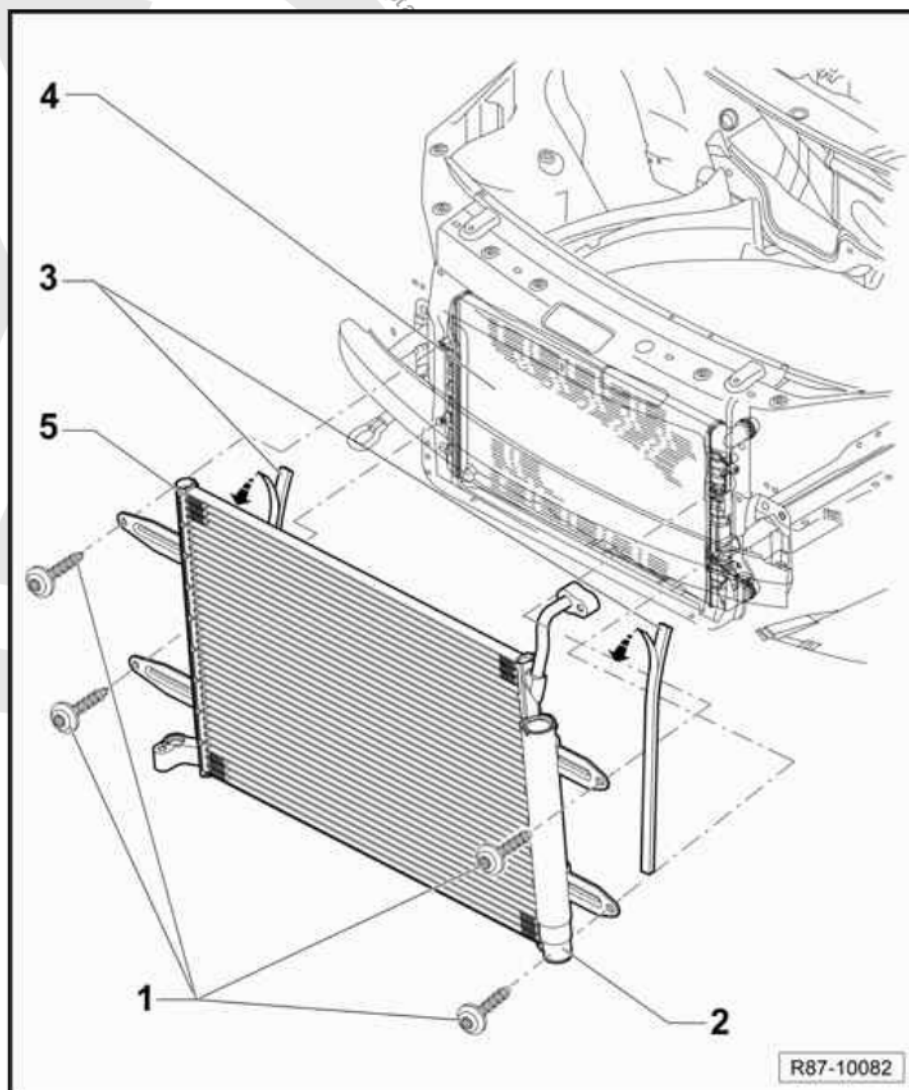
- 1 - Screw
 - ☐ 4 units
 - ☐ 5 Nm
- 2 - Dryer filter receiver
 - ☐ Remove and install
⇒ [page 101](#)
- 3 - Sealing
 - ☐ Replace if damaged
- 4 - Radiator
- 5 - Condenser
 - ☐ Manufacturer "Delphi"
 - ☐ Remove and install
⇒ [page 97](#)



General overview of assembly (Denso condenser):



- 1 - Screw
 - ☐ 4 units
 - ☐ 5 Nm
- 2 - Dryer filter receiver
 - ☐ Remove and install
⇒ [page 101](#)
- 3 - Sealing
 - ☐ Replace if damaged
- 4 - Radiator
- 5 - Condenser
 - ☐ Manufacturer "Denso"
 - ☐ Remove and install
⇒ [page 99](#)



9.5.1 Condenser (Delphi) - remove and install

- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .



Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A- .
- ◆ When the Battery -A- , check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

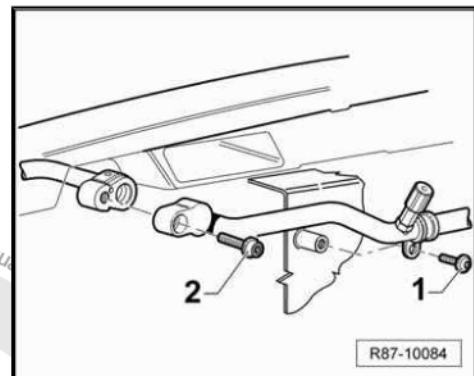
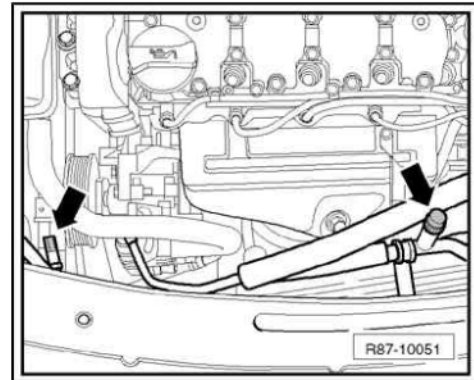


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

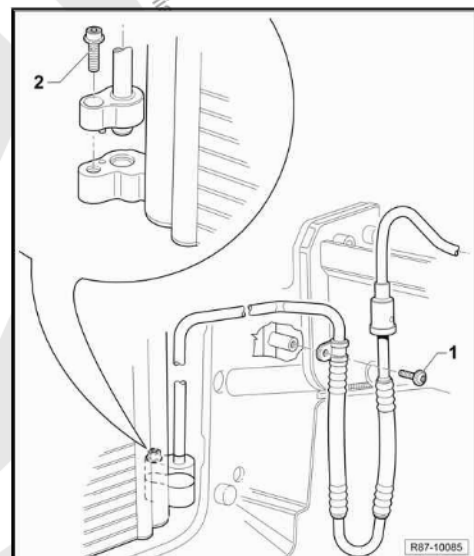


Note

- ◆ *Contaminating the environment with cooling gas is a punishable offence.*
- ◆ *All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.*
- Remove front bumper ⇒ Body - external mountings; Rep. Gr. 63 ; bumpers .
- Install front panel in the "service position" ⇒ Body - external mountings; Rep. Gr. 50 ; Body - Front part .
- Remove fixing screws -1- of clamp.
- Remove fixing screws -2- from the tubing assembly.



- Remove fixing screws -1- of clamp.
- Remove fixing screws -2- from the tubing assembly.
- Remove the Radiator fan -V7- ⇒ Engine; Rep. Gr. 19 ; Cooling system .





- Remove the attaching screws -1- from the condenser -5-.
- Remove the radiator and carefully lift it away from the front panel⇒ Engine; Rep. Gr. 19 ; Cooling system .



WARNING

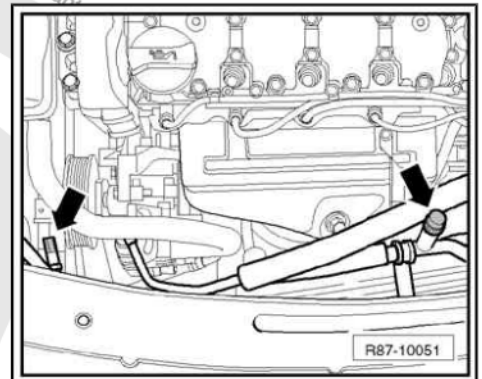
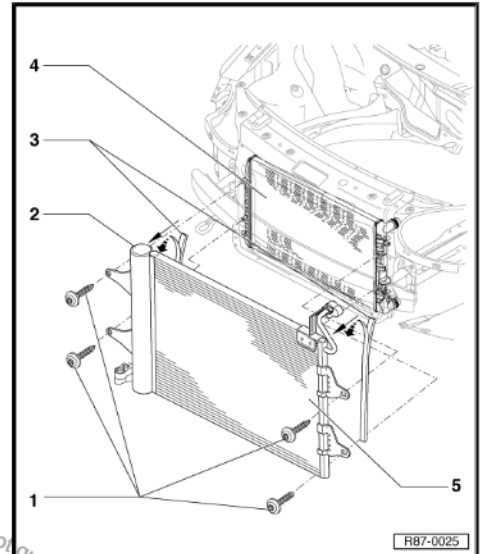
Liquid should not be drained from the cooling system.

- Remove the condenser -5-.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Tighten fastening screws of the condenser with 5 ± 0.5 Nm of torque.
- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Check the amount of gas supplied ⇒ [page 111](#) .



9.5.2 Condenser (Denso) - remove and install

- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .



Note

- ◆ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A- .
- ◆ When the Battery -A- , check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.

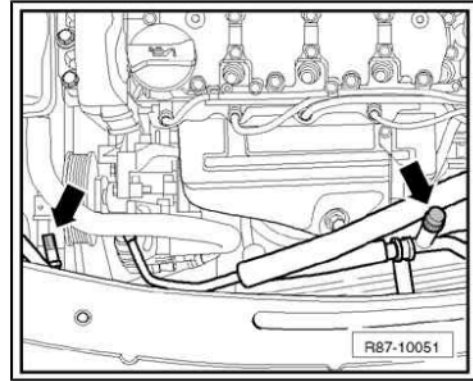


- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .

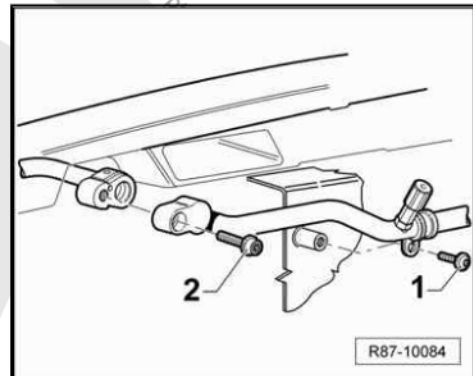


Note

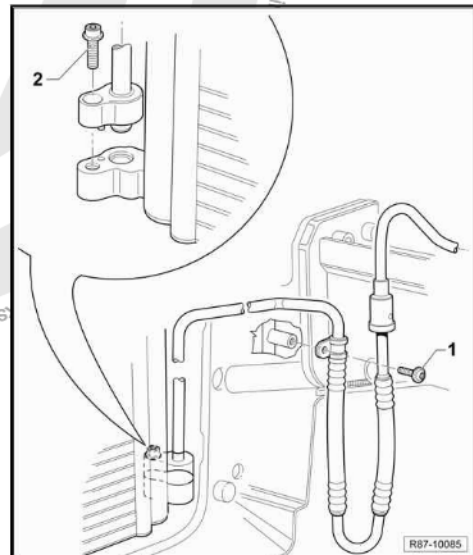
- ◆ *Contaminating the environment with cooling gas is a punishable offence.*
- ◆ *All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.*



- Remove front bumper ⇒ Body - external mountings; Rep. Gr. 63 ; bumpers .
- Install front panel in the "service position" ⇒ Body - external mountings; Rep. Gr. 50 ; Body - Front part .
- Remove fixing screws -1- of clamp.
- Remove fixing screws -2- from the tubing assembly.



- Remove fixing screws -1- of clamp.
- Remove fixing screws -2- from the tubing assembly.
- Remove the Radiator fan -V7- ⇒ Engine; Rep. Gr. 19 ; Cooling system .





- Remove the attaching screws -1- from the condenser -5-.
- Remove the radiator and carefully lift it away from the front panel⇒ Engine; Rep. Gr. 19 ; Cooling system .



WARNING

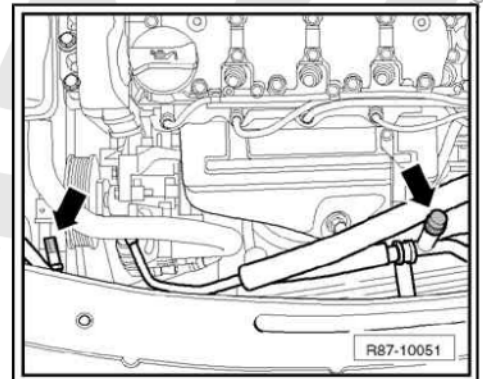
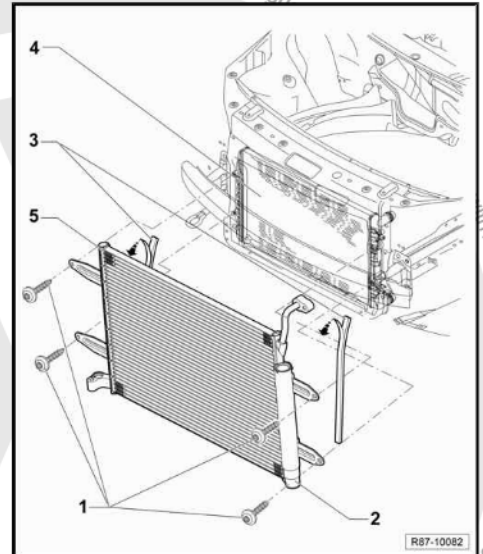
Liquid should not be drained from the cooling system.

- Remove the condenser -5-.

Installation:

Install by inverting the removal sequence, paying attention to the following:

- Tighten fastening screws of the condenser with 5 ± 0.5 Nm of torque.
- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Check the amount of gas supplied ⇒ [page 111](#) .



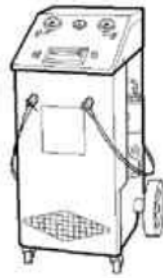
9.6 Dryer filter



Special tools and workshop equipment required

- ◆ Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7104-
- ◆ Climate control recovery, recycling, refilling, and cleaning set -EQ 7105-

EQ 7098



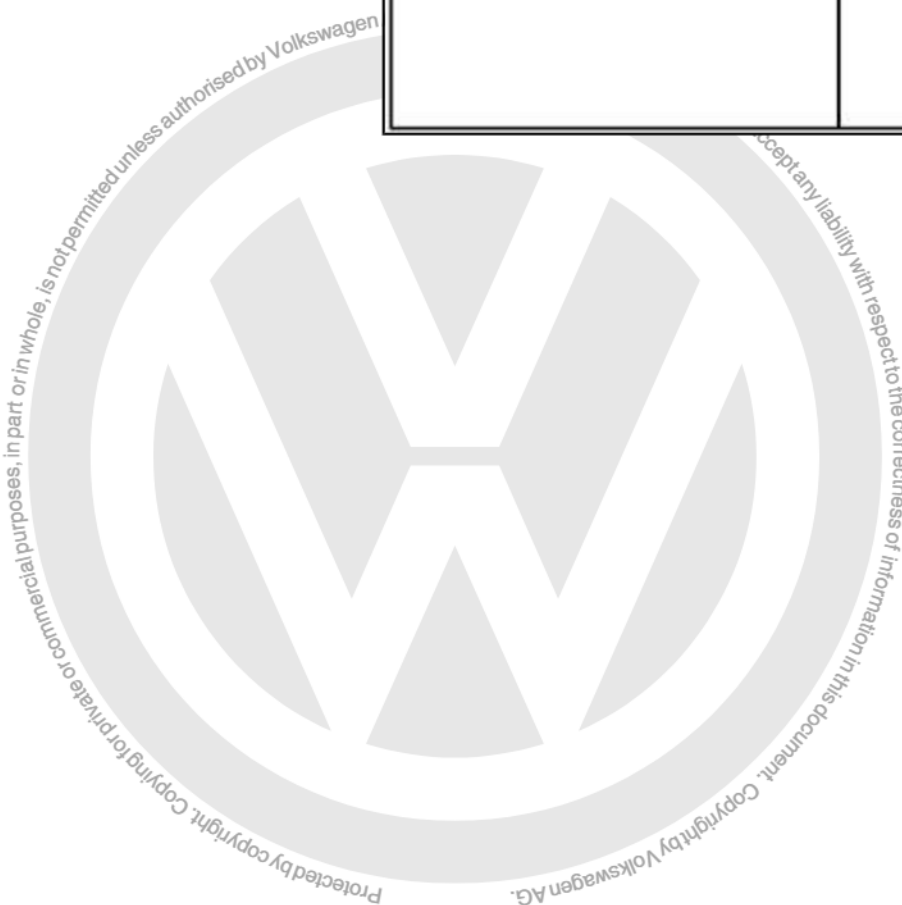
EQ 7104



EQ 7105

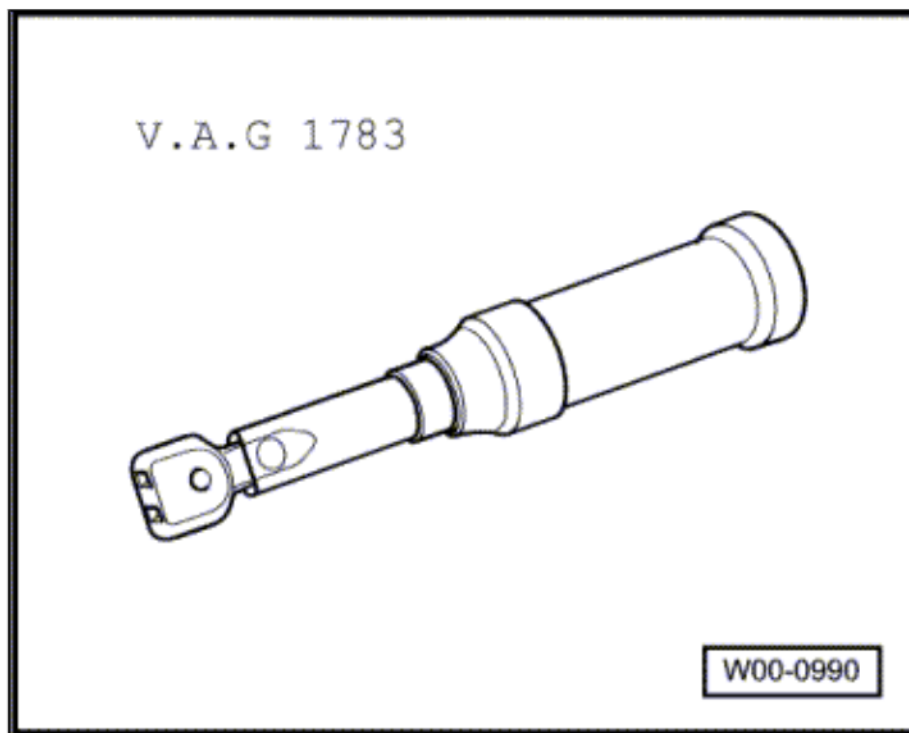


Q87-10002





- ◆ Torque wrench 2 to 10 Nm
-VAG 1783-



The equipment has a rapid coupling adapter for service connections on both the high and low pressure sides.



Note

- ◆ *First, suck out the cooling gas using the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .*
- ◆ *Environmental contamination by cooling gas is a punishable offence.*
- ◆ *All open cooling gas loop components must be closed with proper plugs to prevent the ingress of humidity.*

9.6.1 Dryer filter (Delphi) - remove and install

Removal:

- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ⇒ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .



Note

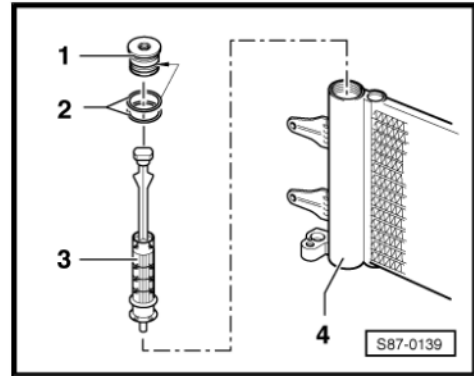
- ◆ *Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A- .*
- ◆ *When the Battery -A- , check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.*
- Remove the condenser ⇒ [page 96](#) .



- Remove the sealing plug -1-.
- Remove the filtering element -3- from the dryer filter receiver -4-.

Installation:

- Replace the sealing rings -2-.

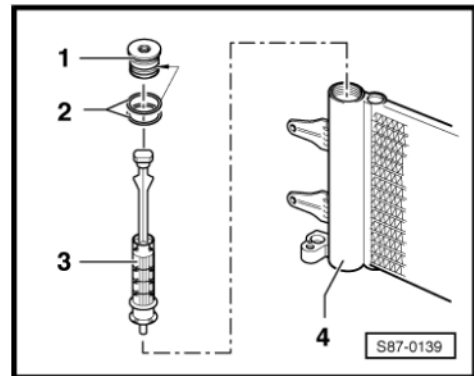


- Install filter -3- to the dryer stop -4-.
- Install new sealing rings -2-, after lubricating them with cooling gas oil in the sealing screw -1-.
- Install sealing screw -1- to a torque of 4.5 ± 0.5 Nm.

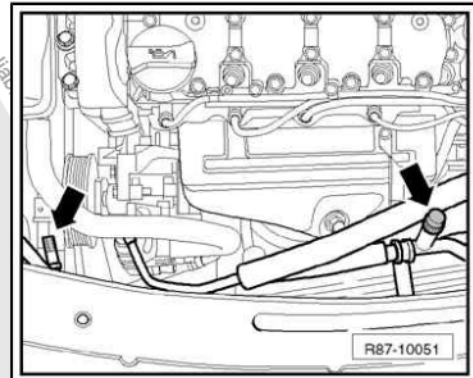


Note

The purpose of the dryer filter is to accumulate drops of fluid and to send them to the expansion valve, in an uninterrupted flow. Humidity that penetrates into the cooling loop during assembly is absorbed by the dryer filter.



- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ➔ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Check the amount of gas supplied ➔ [page 111](#) .



9.6.2 Dryer filter (Denso) - remove and install

Removal:

- Turn the ignition and all electric components off and remove the key from the ignition.
- Disconnect the Battery -A- ➔ Electrical equipment; Rep. Gr. 27 ; Starter, alternator, battery .



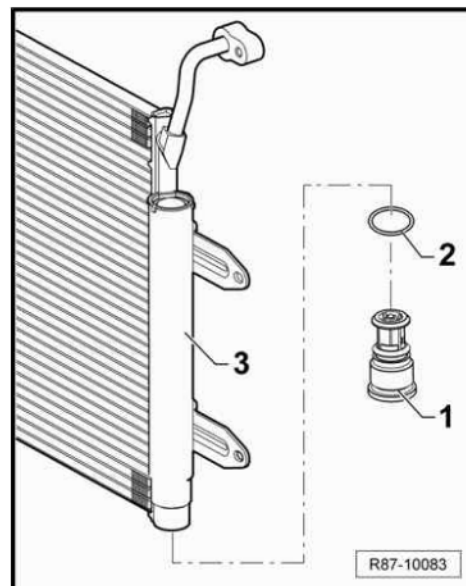
Note

- ♦ Check whether the vehicle has a coded radio. If so, request the anti-theft code before disconnecting the earth strap of Battery -A- .
- ♦ When the Battery -A- , check the vehicle's equipment (radio, clock, electric door locks, power windows, etc.) according to the repair manual and/or instructions for use.
- Remove the condenser ➔ [page 96](#) .



- Remove the sealing plug -1- with the filtering element.

Installation:

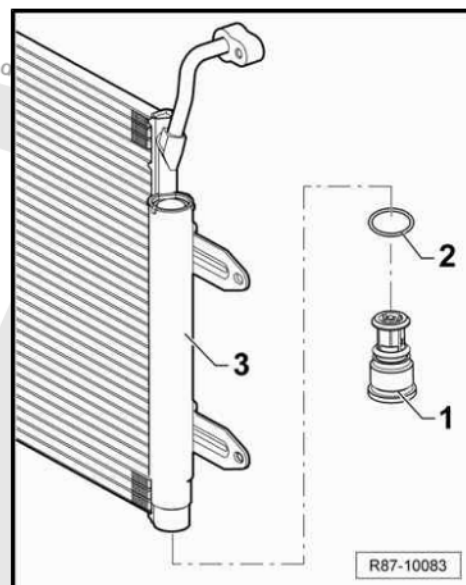


- Replace the sealing ring -2-.
- Install new sealing rings -2- lubricating it with cooling gas oil in the sealing screw -1-.
- Install sealing screw -1- to a torque of 3 ± 1 Nm.

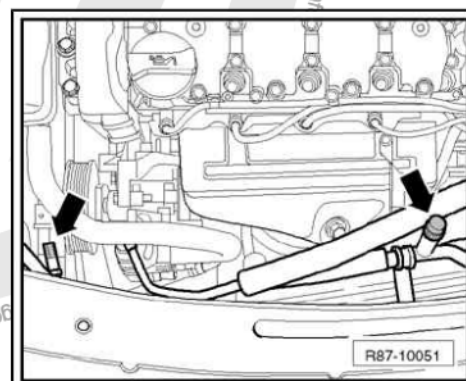


Note

The purpose of the dryer filter is to accumulate drops of fluid and to send them to the expansion valve, in an uninterrupted flow. Humidity that penetrates into the cooling loop during assembly is absorbed by the dryer filter.



- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and fill the system with gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .
- Check the amount of gas supplied ⇒ [page 111](#) .



9.7 Expansion valve - remove and install



1 - Evaporator case/engine compartment partition panel sealing

- ☐ Observe the installation position ⇒ [page 63](#) .
- ☐ Replace if damaged.

2 - Seal ring

- ☐ Replace
- ☐ 11.10 mm; 1.78 mm

3 - Expansion valve

- ☐ Remove and install ⇒ [page 106](#) .

4 - Seal ring

- ☐ Replace
- ☐ 10.8 mm; 1.82 mm

5 - Cooling gas hose

- ☐ High pressure
- ☐ From dryer filter to expansion valve

6 - Cooling gas hose

- ☐ From expansion valve to compressor

7 - Screw

- ☐ 5 Nm

8 - Screw

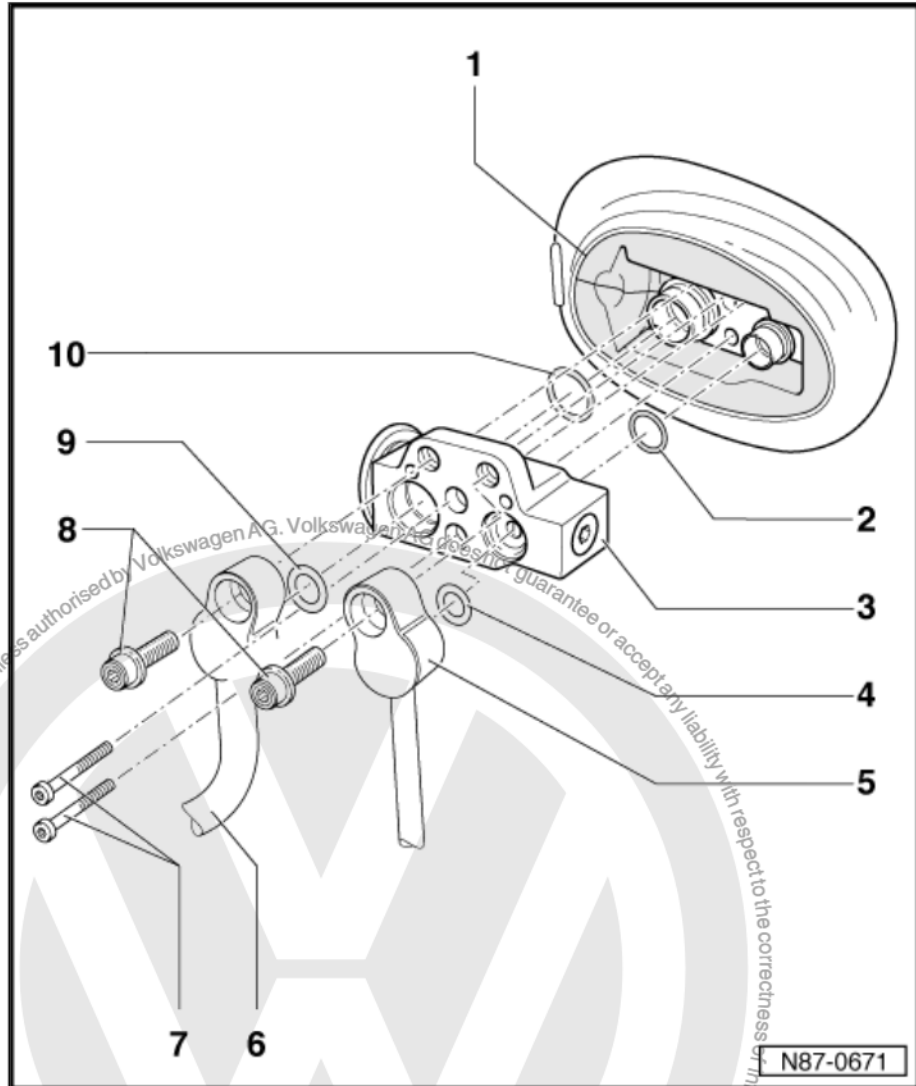
- ☐ 2 units
- ☐ 10 Nm

9 - Seal ring

- ☐ 14.30 mm; 2.40 mm

10 - Seal ring

- ☐ 17.17 mm; 1.78 mm



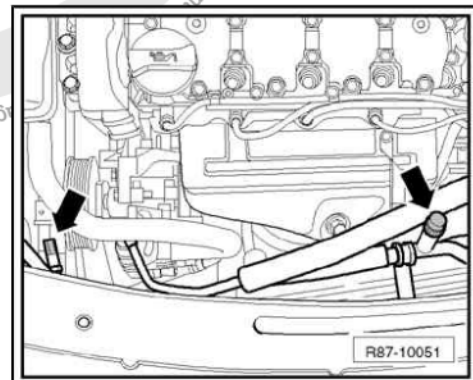
9.7.1 Removal

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .



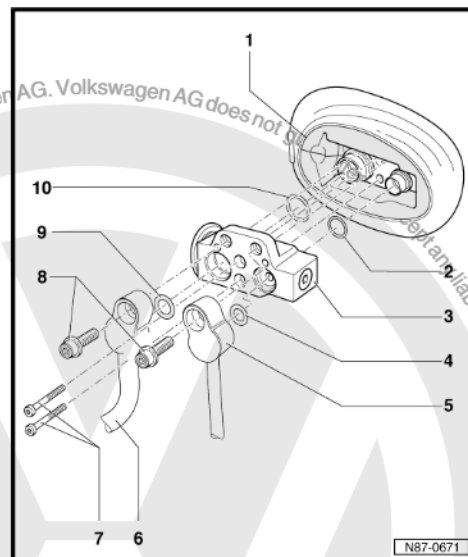
Note

- ◆ *Contaminating the environment with cooling gas is a punishable offence.*
- ◆ *All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.*





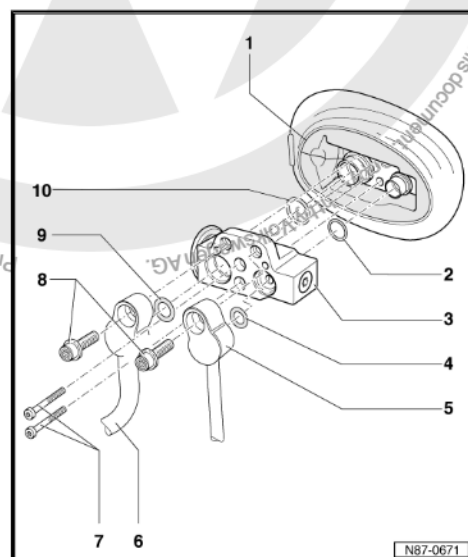
- Remove screws -8-.
- Remove the cooling gas hoses -5 and 6-.
- Remove screws -7-.
- Remove the expansion valve -3-.



9.7.2 Installation

Install by inverting the removal sequence, paying attention to the following:

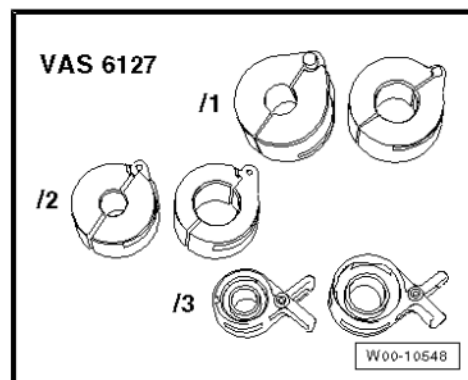
- Replace the sealing rings -2, 4, 9 and 10-.
- Tighten belt fastening screws -7- to a torque of 5 Nm.
- Tighten belt fastening screws -8- to a torque of 12 Nm.



9.8 Rapid coupling - remove and install

Special tools and workshop equipment required

- ◆ Disconnect or -VAS 6127-



- ◆ Disconnect or -VAS 5231-



- ◆ Disconnect or -VAS 5231/1-
- ◆ Safety goggles
- ◆ Gloves

9.8.1 Rapid coupling removal



Note

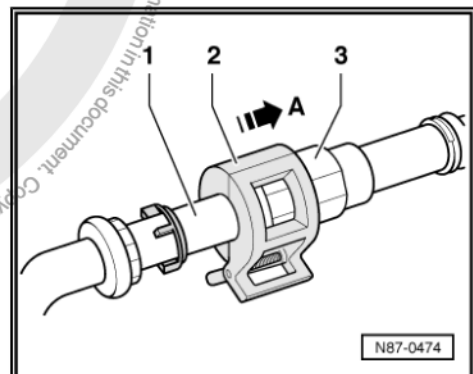
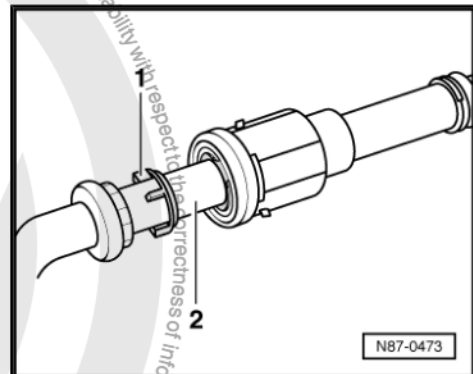
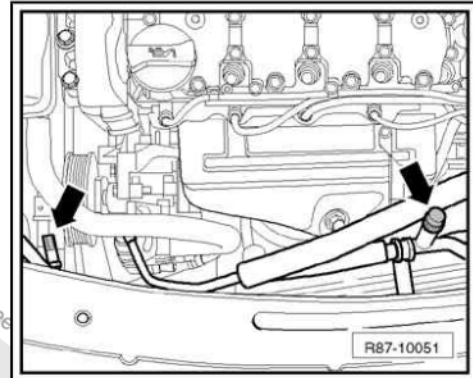
After every removal, the sealing ring, locking insert and safety ring must be replaced.

- Connect the Climate control recovery, recycling and refill set or VAS 6008 -EQ 7098- or similar equipment to the service valves -arrows- of the cooling gas loop and suck out all the gas
⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Technical data .



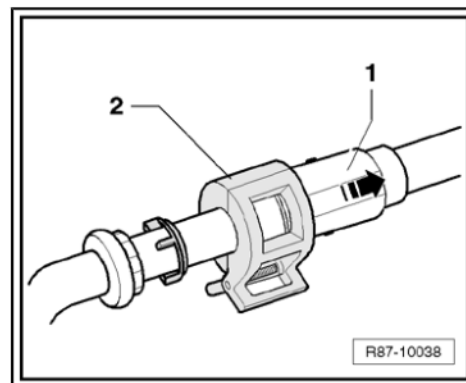
Note

- ◆ *Contaminating the environment with cooling gas is a punishable offence.*
- ◆ *All open cooling gas loop components must be closed with the proper plugs in order to prevent the ingress of humidity.*
- Move the sealing caul -1- from the coupling of the cooling gas lines -2-, so that the assembly area is free of the coupling.
- Place disconnecter -2- in the coupling segment. The cuts on the tool must be in line with the indicators.
- Push the disconnecter -2- in the direction of -arrow A- into the compressor lines -1- against the coupling stop -3-.



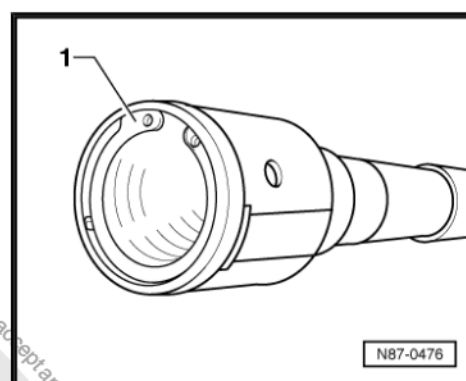


- Hold the disconnecter -2- on the stop and pull coupling -1- in the direction of arrow.
- After every removal, the sealing ring, locking insert and safety ring must be replaced.

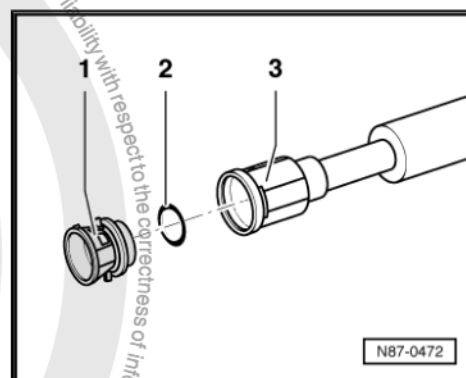


9.8.2 Removing the rapid coupling components

- Remove the disconnecter and remove lock -1- from the coupling using suitable pliers.

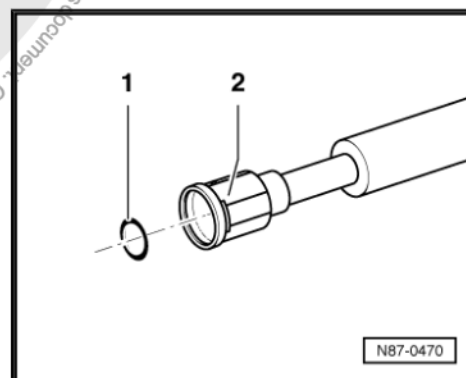


- Remove locking insert -1- and the sealing ring -2- from the coupling -3-.



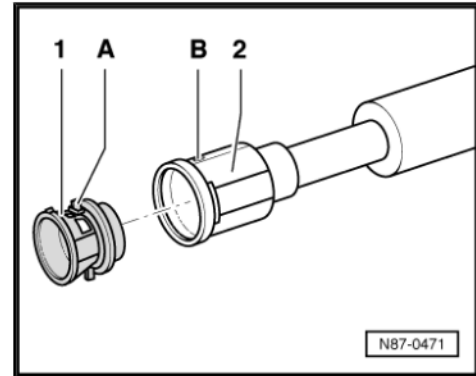
9.8.3 Installing the rapid coupling components

- Dampen the sealing ring -1- with cooling gas oil and insert the sealing ring into the coupling -2- to the stop.

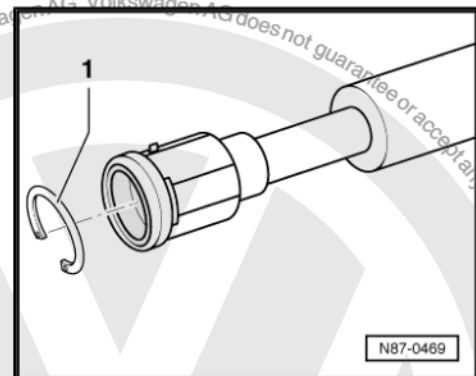




- Insert the locking element -1- into the coupling -2-. The indicators -A- must be positioned so they align with the holes -B- of the coupling.

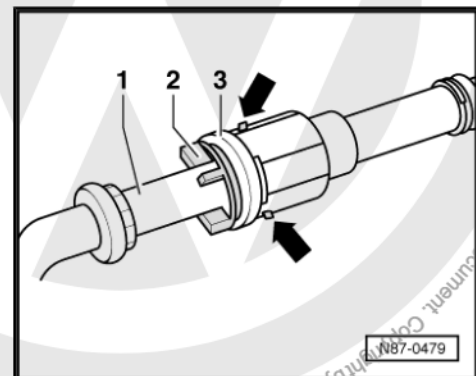


- Install the lock -1- with proper pliers.



9.8.4 Rapid coupling installation

- Introduce the compressor tubing -1- of the coupling area into the coupling -3- of the refrigeration gas tubing until the indicators are protruded from the holes -arrows-.
- Move the sealing caul -2- to the coupling -3- so that the sealing bellows adjusts to the coupling.





10 Filling capacities

10.1 Cooling gas R134a

Compressor	Manufacturer	Filling capacity
CVC	Delphi	450 ± 25 grams

10.2 Cooling system oil

A special oil must be used exclusively for R134a cooling gas loops, which should not be purchased in stores that sell oil for machines with cooling gas.

Refrigeration system oil may be purchased under spare part No.; for:	
CVC compressor; manufacturer Delphi	G 052 154 A2

Type	Manufacture period	¹⁾ of supply
5Z0 820 803	as from 03.10	150 cm ³

1) This quantity of refrigerant system oil is in the replacement compressor and corresponds to the filling capacity.

Important information:

Since the cooling system oil is highly hygroscopic, any open containers must be closed immediately after use, protecting the container contents from moisture.

Because of its chemical properties, the cooling system oil must not be disposed of together with engine oil or transmission oil.

10.2.1 Oil distribution

Oil within the compressor oil sump, prior to the activation of the air conditioning for the first time, is distributed through the refrigerant gas circuit, as follows:

- ◆ Compressor approx. 50%
- ◆ Condenser approx. 10%
- ◆ Flexible intake tube approx. 10%
- ◆ Evaporator approx. 20%
- ◆ Liquid/dryer reservoir approx. 10%

When replacing the loop components, correct the quantity of cooling gas oil. Check additional recommendations, concerning:

- ◆ Replacing the compressor ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Replace the air conditioning compressor .
- ◆ Liquid tank replacement ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Replace the liquid or collector reservoir and the throttle .
- ◆ Replacement of the remaining components ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Damaged or leaking components (except compressor, liquid or collector reservoir) .

In case of doubts about the quantity of cooling gas oil in the respective circuit, clean it, and then replenish with the recommended quantity of cooling gas oil ⇒ Air conditioning with R134a cooling gas; Rep. Gr. 00 ; Cleaning the cooling gas circuit .



05.11

